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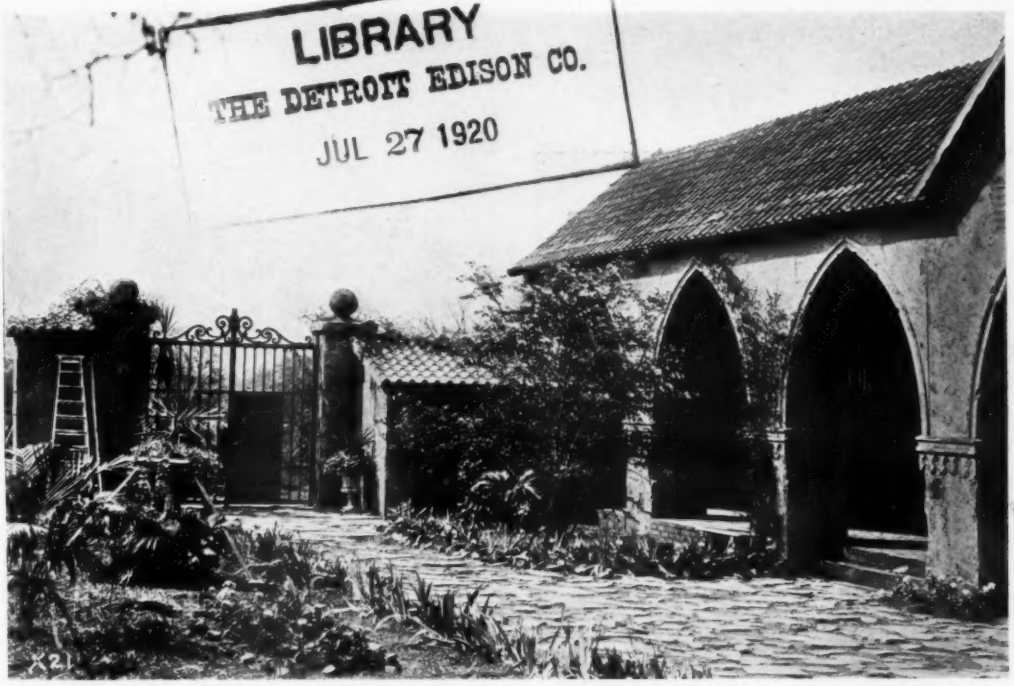

A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

This building and gateway represents the yard of a Spanish convent for the production of "The Avalanche." It was constructed out of doors with plaster walls, Spanish tile and real stone pavements

Architectural Problems in Motion Picture Production

By JAMES HOOD MACFARLAND

Illustrated by Examples of the Work of Robert Haas, Architect for Famous Players-Lasky Corporation

A NOVEL having a sale of twenty-five thousand copies is a successful and popular novel. A newspaper having a circulation of one hundred thousand copies is a successful paper of great influence. A magazine of one million copies in each issue cannot be overlooked. But let us consider the motion picture production.

Statistics have told us that ten million people see motion pictures each day. The average attendance at one of New York's motion picture theatres is eight thousand daily. The picture runs for seven days and fifty-six thousand people view it. If at the same time the picture is being shown —as is usual—in twenty-seven other cities for a week's run, our estimate is that a million five hundred thousand people over the country view the same picture the first week it is run. That is the beginning of the picture's life and influence.

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Six years ago, at the time when the first feature picture made its appearance, not much attention was given to the building and construction of interior and exterior "sets," the attention being particularly directed to the action of the scene. The backgrounds upon which a plot was enacted were borrowed from the stage, which was, of course, the natural thing to do. Settings were used which now appear to be ludicrous: a painted drop, for example, giving the impression of trees but with a branch from a real tree secured through it to impart realism. The branch was hitched with a string

A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

This room in L'Art Nouveau was constructed for "On with the Dance," a George Fitzmaurice production. It was imagined for the occupancy of a woman of the demi-monde. Particular interest attaches to the room because it is one of the few times that a ceiling has been built to be shown in a motion picture interior

and it swayed realistically when a stage hand yanked it. Or again there were rooms made of canvas and painted, rooms which shook and swayed and threatened to fall as the characters opened and closed the doors.

Throughout the six years time in which the motion picture has risen from a cheap form of entertainment to the fifth largest industry in the country, more and more attention has been paid to the selection, designing, building and decorating of the backgrounds, or "sets" as they are called in the technical language of the motion picture studio.

LONG before the public had a chance to demand it, the producers—always with a finger on the pulse of the public—realized that if motion pictures were to hold their increasing popularity more effort must be devoted to the selection and building of suitable backgrounds upon which to tell the story and it was then that suggestion as it is used upon the stage became substituted by realism.

Architects and decorators were attracted to this new industry and now there is hardly a company which does not employ the skill of experienced architects, many of whom gave up excellent practices for the opportunity of assisting to place before the public correct architecture and decoration. An attempt has been made to show, at the beginning of this article, the tremendous public witnessing the work of these men—and now we may ask ourselves—Does the public appreciate this work?

And the answer is—Yes, not only does the public appreciate it but the architectural profession as well. For the producers have received unsolicited letters of commendation from architects, letters which were inspired by nothing other than the beauty and correctness of the architecture as represented in the pictures. As for educating the public to appreciate the beautiful, there is no doubt but that the efforts are successful, possibly in most cases only in a subconscious way, but it is everywhere apparent the general demand is always that more attention be paid to the correctness of the surroundings in which the action takes place.

One thing must be borne in mind when considering from an artistic standpoint the educational value of motion pictures. In planning "sets" every effort is made to place the characters in the surroundings which they would choose in real life rather than to make each "set" an example of some form of absolute artistic achievement. Take for example the character of a newly made millionaire who comes to New York for a splurge. He would surround himself with gaudy, flashy appointments, with the idea of exhibiting his newly acquired wealth. By placing him in surroundings such as he would himself choose, his character may be forcibly and quickly pictured—"put over," so to speak, without encroaching on the field of literature with long and tiresome explanatory titles. An establishment set up by a titled Englishwoman who brings her daughter to this country in an effort to arrange an advantageous match would be perfect in the taste of all its appointments. Therefore, when criticising

the "sets" it will be seen that it is necessary to also consider the character.

Reproductions of internationally known buildings, places of interest and objects of art are being made faithful to detail through the use of reference libraries which are kept constantly up-to-date. Scenes depicting the Casino at Monte Carlo are constructed in the studio; they would be passed without criticism by any one familiar with that famous gambling resort.

A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

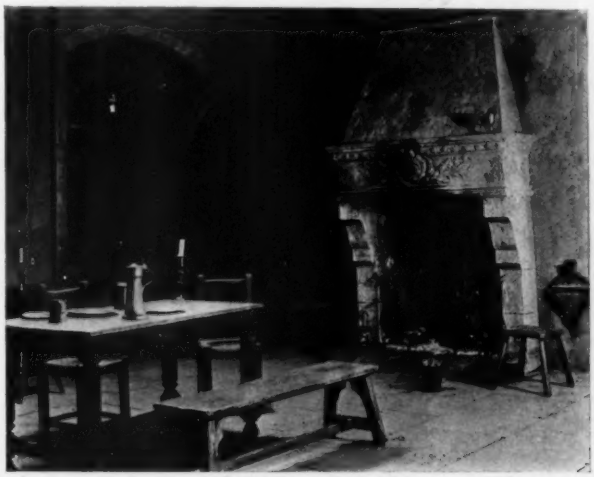
This house is intended to be characteristic of the hard lines so common in the early work of the Middle West. The people who are supposed to have lived in this house were hard-fisted and without taste. Probably they were economical on architect's fees

Once at a New York theatre when the program included as a feature film, "The Society Exile," which opens in Venice upon a canal built with all elaboration in the studio; the theatre management developed its program in this way. It gave first a travel picture of a trip about Venice which closed with a long shot of the Grand Canal. Then, without intermission, came a long shot of the studio-built canal; actual water, mooring posts and moving gondolas. It was a trying comparison, a stiff test, yet the audience never thought but that they were still watching pictures which were taken in Venice.

The public is demanding that the pictures be accurate in every little detail and the lengths to which the producers will go to reproduce scenes with absolute realism are interesting. In building a shack to represent a structure on the South Sea Islands, three trucks were dispatched from the studio to scour the beaches of Long Island, picking up driftwood and galvanized iron until enough building material was accumulated to construct several shacks and from this debris the architects made careful choice.

WHEN the interiors are constructed upon the studio floor, they are built by the carpenters from carefully prepared blue-prints made in the Art and Decoration department. No tricks of perspective are used in the construction of these "sets," which seems to be contrary to the general belief; the rooms and houses are built (though with certain eliminations) exactly as they would be if intended for actual use. The men who design the "sets" are constantly striving for the better effect of actuality.

One of the recent developments has been the construction of rooms in a proper and harmonious group rather than the building of one room at a time. It is not an unusual thing to see an entire lower floor representing the interior of a spacious home built upon the stage at one time. Entering through a doorway one walks into the reception hallway and on the left finds the reception room, he sees a library and to the right a living room and dining room. Somewhere in the group is a stairway leading upstairs and through some distant door may be seen a sunny porch or conservatory. This adds more realism and permits the artistic camera shots through vistas which



A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

A reproduction of an old English inn. The fireplace shows the Italian influence brought to England with the sculptors imported by Queen Elizabeth

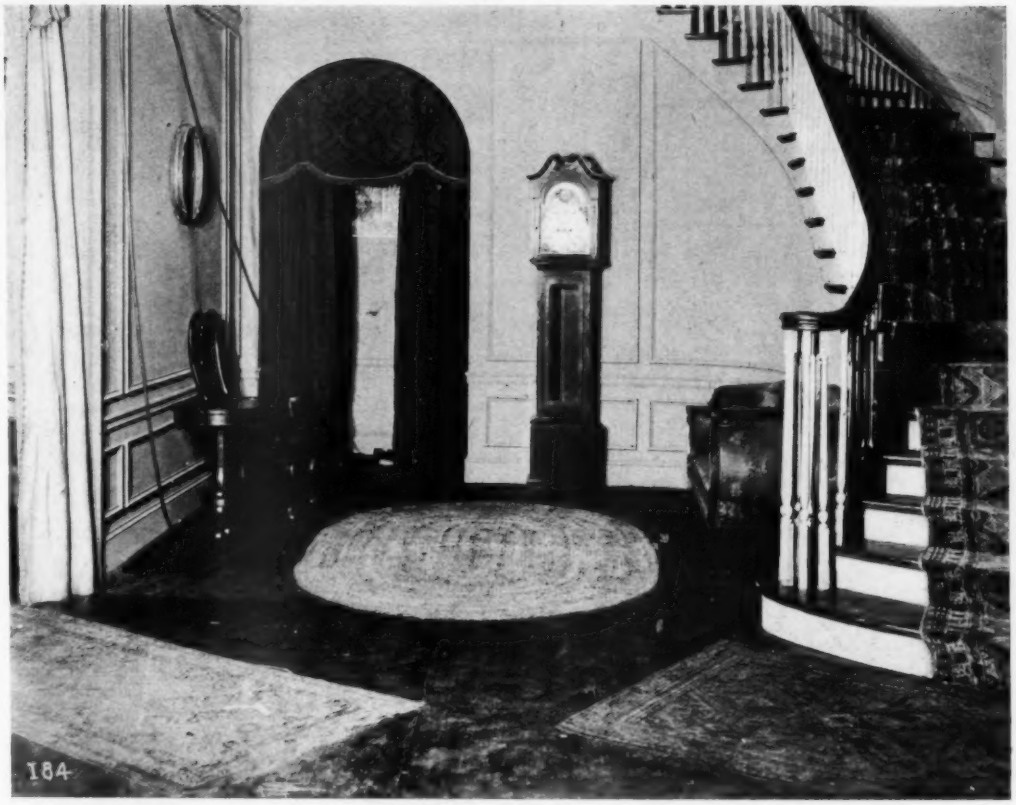
A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

This set used in a George Fitzmaurice production called "The Right to Love," represents the upper hall of a house presumed to have been built in Turkey by an English architect for the occupancy by an English gentleman. Real plaster walls have been built with actual tiles inserted for decoration

could not be obtained if a single room were constructed at a time. For instance, when the camera follows a guest who approaches the entrance door, the guest is not left standing there, but is admitted by the butler. As the door swings open we may follow him through the reception hallway and have glimpses of other rooms just as we would in real life; and when, in the further development of the plot, these rooms are shown more completely, we recall them and the memory serves as another means of knitting up the unity of impressions.

When planning the locations for the George Fitzmaurice production, "The Right to Love," it was decided, in representing a palace on the Bosphorous, to use an estate occupying one of the islands off the coast of Florida. After permission was obtained a cameraman was dispatched to make photographs of the estate from every angle. He returned with nearly seventy-five pictures, including close-ups of doors and windows. The department of Art and Decoration, using these photographs to guide them, went ahead on plans for the interiors. In this manner it was possible to match up the interiors and exteriors perfectly although they were separated by many miles. As an example of the attention to detail, the director of the picture stopped all work until the proper kind of handle for the door was procured.

One who is not familiar with the mechanical side of the production of motion pictures would naturally inquire what was the reason for not taking the interiors while the company was there on the location; why, in this film were not the interiors also taken upon the estate off the coast of Florida, thus avoiding all the work of building the sets in the studio? This could have been done if it was practical to transport the necessary lights. There are sunlight arcs of three thousand candle power strong (exposure to this light for half an hour will produce a sunburn quite as good as a day spent on



A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

Representation of an American colonial hallway. A complete room adjoins at the left and the stairway leads out of the picture to a platform. The house had no second floor. Note the stair carpet, which gives the required touch of modernity. The cable of the studio lighting device had not been put in place and hangs over the mahogany hall table

the beach); there are Cooper-Hewitt banks, spots and Kleigs—all necessary to secure the illumination of interior views but bulky and difficult to handle in the restricted spaces of normal rooms, even if it were possible to obtain the current necessary to operate these batteries of lights. Special cables supply the studio. Another reason for constructing the interiors in the studio brings up an old story about a motion picture carpenter not being trusted with the building of a house, for he might leave off the roof or a side. It is exceptional to see the ceiling of a room in a motion picture. The ceiling is left off, for in its place there must be enormous flood lights to eliminate all shadows.

The detail involved in a production such as "The Copperhead" which was recently produced by the Famous Players-Lasky Corporation is tremendous. Two months before the production was begun, the Art and Decoration department began their research work. After many vain attempts to find the documents they required to reconstruct a town of the period 1846, the information was finally located in the Newark Public Library. From the information secured a town was built at Elmhurst, L. I., in addition to the court house and church it contained ten houses lining the main street. One interesting fact in the construction of this town was that contrary to usual, the houses were built up on all four sides, making it possible to photograph from any angle. The houses were used by the workmen while building the town and by the thousand people employed to lend atmosphere when photographing. This same town went through three periods: first 1846, after which it was remodeled for 1861 and after that—1904. The changes were marked and were worked out with a careful attention to detail; a flag (as one instance) was made which bore but twenty-nine stars, although at no time was the flag close enough to the camera to register plainly.

In the tremendous audience of a motion picture there are bound to be those who are familiar with some one particular thing and only too willing to show their knowledge in criticism. These are the ones who appreciate the attention to detail, such as has herein been in part described, and it is for the most critical audience that motion pictures are now made.

Museums Urge Fine and Industrial Art Combinations

Museums and the influence they should exert on the communities in which they are established were among topics discussed at the recent annual convention of the American Federation of Arts in the Metropolitan Museum of Arts, in New York.

The future museum, Richard F. Bach, of the Metropolitan, said in his address, will be a combination of the fine art and industrial art institutions under a single governing body with separate directors. Such a museum, he declared, would maintain close relations with the industries of the town or city in which it was established and work with them to raise the artistic standard of American productions of all sorts.

Charles L. Hutchinson, President of the Chicago Art Institute, led the discussion on the best methods of extending the influence of the federation. He announced that a clearing house for art information had been established and was proving effective in fostering interest in Western and mid-Western States.

George W. Stevens, director of the Toledo, Ohio, Art Museum, spoke on "How to Establish an Art Museum," saying that his city had not waited for "some woman to die" in order to obtain funds for the establishment of such an institution, but had plunged boldly in and to-day had on hand assets of $3,000,000.

George W. Eggers, director of the Chicago Art Institute, discussed "Museums as Community Centers." Francis G. Jones, Allen Eaton and Joseph Pennel presented a petition signed by more than 500 artists here and abroad urging that reforms in the copyright law be accomplished to make it conform to the British law.

George S. Booth, of Detroit, and H. K. Bush-Brown, of Washington, also spoke.

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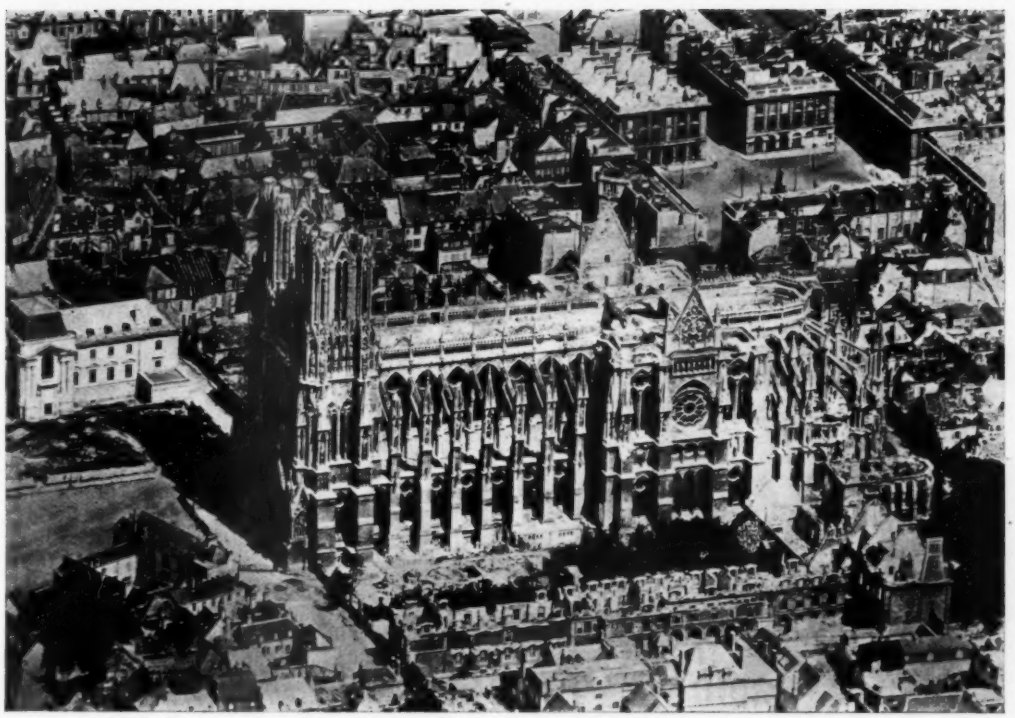

RHEIMS, FROM THE AIR

Reconstruction of Northern France—Part II

By Ralph Fanning, *M. A., B. Arch.*

The Northern French Village Before The War

THE present day tourist, bent upon obtaining "de luxe" all the war thrills that a well organized Cook's can crowd into a trip of several days, is hurried from the Somme through the departments of the Aisne, the Ardennes and the Meuse. If he registers impressions well, he is rather certain to return with crowded reels of battlefields, trenches, desolate landscapes and destroyed towns, recorded on his mental films. After being deeply impressed by the great waste areas of the old battle lines, awed by the vast destruction outside of Verdun, and thrilled by battered Rheims with its great cathedral, more majestic than ever, towering above the ruins with an immortal beauty, he has, perhaps, little energy left for the contemplation of reconstruction problems for these tragic scenes. Yet there is a feeling among most who have witnessed these scenes that all expediency should be used in erasing and obliterating the scars of war, as one would try to conceal the blots upon the records of a boasted civilization. Nature has already done much to heal the wounds. Man, shackled with all the fetters of complicated political and economic modernism, must strive to do his part.

In approaching the problems of reconstruction in Northern France, it may be well for one to carry a mental picture of the pre-war village of these districts, so few of which have not been sadly changed. There is the immediate need of recreating the villages, churches and farms, that are now but crumbling masses of ruin, to facilitate the continuation of a course of life that centuries of civilization had developed. Americans, for the past fifty years, have been accustomed to seeing cities spring up in a marvelously short space of time with the rapid growth of virile industries. The West has frequent instances of this mushroom growth in its municipal life, but it is invariably upon virgin fields nourished by undrained resources.

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Such are not the problems of Northern France. Here is a country exhausted of much of its natural and artificial wealth, but already refilled with a loyal, pathetically home-loving people bound by certain very strict traditions of life and building. To understand this and approach the problem in a just manner, one must try to recall the little French village in its pre-war days—the little village because these harbor much that is real and true and worthy of preservation in French national life.

Let one close one's eyes for a moment on the debris and barbed-wire, on the acres of crosses

A VILLAGE STREET

and the fragments of churches and try to recall the picture of another day. Let it be a picture on a day in spring or early summer in 1912 or 13. A turn on a hard white road revealed a cluster of warm red-tiled roofs huddled about some towering gray spire in the midst of many colored fields running over the slightly rolling hills like a grandmother's crazy-patch-work quilt over a soft feather-bed. Fresh greens and yellows and madders with strips of dark woodland and gray willow banks enframed the village: smoke blue horizon and distant hills melting into freshly washed sky-blue made a background. It was a picture to entice one to turn from the dust growing road and stop by the blue smocked old stone-breaker, leisurely pounding in the shade of the wayside fruit trees, to ask the name of the "petite ville" and inquire as to which of its cafés would serve the best supper. The name of the village might have been "Villers en Argonne" or "Dun sur Meuse" or numerous variations of "Clermont" or "Brabant," of "Beauchamps" or "Chaudfontains." One was sure to find the recommended Café de la Madeleine or Café du Singe Verte or Hôtel de Paix, with its genial, bemoustached host and politely shrewd Madame to give one welcome and cater to ones desire for "café au lait" or "vin rouge ordinaire."

There would usually be one long main street on either side of which the century old houses clustered, leaning on one another in relaxed familiarity. Soft yellow and gray stone might be varied by plaster and half-timber, while a more vivid brick might add a warmer note to harmonize in the moss-grown tile roofs and terra cotta chimney-pots. Gentile freedom, but no license, was the key-note of the village street. A graceful curve was in its course and to its line the houses conformed. Here, the street might invite domestic intimacy and even familiarity as it gave place for farm carts around a drinking trough, or for the games of a crowd of black-aproned garçons. Beyond, realizing its public importance, it would widen out into pronounced formality to announce the mairie by an introduction of trimmed planes or rarer clipped yews. It might even develop into a proper village square with a fountain and promenades for public functions or space for an out-door market-place. Then, relaxing from the dignity demanded by municipal life, the friendly road would take an easy curve down over an old stone bridge, even giving way to such wanton abandon as to dip into the flowing stream where old housewives on their knees in boxes of straw, with back-aching industry, paddled the linen white in the frothy waters.

IN many villages, the dusty highway would have a rival for its locomotive interest in the canal with its shady cow-paths, its locks and bridges, inviting prolonged interest. An old stone cross by the roadside, a nitch sheltered Virgin enshrined on a bridge, proclaimed devout progenitors. If such did not call forth the obeisance of the passing marketman, a deserted stone "octroi" might well make him give thanks for the better day when an eighth of his produce did not have to be surrendered as toll or tax to stronger though worldier powers.

Over road and bridge from field or barge, the peasants would come driving their tandem teams before loaded two-wheeled carts, or with village flock or herd with barking dogs and squalling geese to arouse the village from its afternoon quiet. The doors of the old houses would open to admit

the homecomers and emit the savory odors of cooking suppers. The wider street doors with stone arches or great oaken lintels supporting the wall above, admitted the teams and cattle into the rear courtyards where, in compact quarters, were the seats of household activities, be they agriculture, commerce or craft. Passing from the courtyard into the house, which also opened directly from the street either as shop or dwelling, one found a simple arrangement. The main room was the living room in fact, with cooking range or great fireplace with its shining array of copper and pewter; the table laid with colored linen and figured plates and bowls; flowers blooming in the small windows and cat and canary to welcome one into the family. Perhaps a spiral stairway in the corner led to sleeping rooms above with their great feather beds covered with red satin "duvets" reflected in the much belabored parquet floors. Great ceiling beams would tell of the age of the house built in the days of rough hewn but solid construction.

Hospitality was the law of the land, the inn simply being a home where it could be dispensed with greater ease. It would be built and furnished like the other homes, but naturally on a somewhat grander scale, and with a more conspicuous frontage for the public gaze. Exteriorly, nearly all presented the same appearance of soft stone walls with pleasing variations of wood and plaster, small panes in casement windows behind wooden shutters, moderately pitched roofs with dormers symmetrically placed, but saved from any monotony by varying levels and varieties of hipped gables and unexpected chimneys.

Mingling in the common conversation of the inn, it would be strange if one did not hear some refer-

FARM CHÂTEAU IN THE MIDST OF THE ARGONNE—BEAUCHAMPS

ence to the chateau. This might be only an isolated little mansion apart from the village, or, on the other hand, a grand affair set in a wide park with elaborate gardens. In any case, the chateau, with the saintliness or villainy of its occupants, seem ever to have been an important factor in village life, and the building the object to be pointed out with pride to all visitors. There was something invariably characteristic, invariably charming about the French country-seat, although the last century had witnessed the building of many that did not add

THE CHÂTEAU-WALLY—MEUSE

to the credit of architectural taste. In most cases might be found a graceful setting, a studied formality and a pretentious design. These, of any class of buildings in the invaded regions, seem more often to have escaped damage except by occupation.

Dominating over all the village architecturally as well as socially, would be the church. Volumes could be written about the part the church has played in French life, and nothing could be of more interest than these structures which greatly antedated any other building in the village. Often reaching back almost to Roman times, they were built with a solidity that, until the great war, had defied most of the destructive agencies of time. The rest of the village might change, burn or decay, but the church remained the main motif of the village picture. Simple, basilican types, these churches would often show excellent stone vaulting over the nave and side aisles with massive supports of columns and thick walls. The small windows would be filled with well executed stone tracery and bits of early glass were not rare, although in the poorer districts, much of the glass was painted. A Ro-

manesque tower of sturdy proportions seemed often to antedate and oddly join a later Gothic structure, but in most cases this formed the dominating feature regardless of the more recent additions of copper plated turrets, ogive openings or Rococo

BRIZEAU—MEUSE

doorways which different periods imposed upon the chief architectural structure of the village.

IN such a setting, one can picture the pre-war village of the now devastated regions of Northern France. Of course, the villages and towns were not all the same. In fact, one of the most typical things about French villages at large was their individuality, each with its prided feature of ancient tower or historical shrine or, perhaps, only its reputation for the output of a special brand of "confiture." Another typical characteristic was their isolation and contentment with such, for many were the old dames who had seldom if ever traveled beyond a ten kilometer radius. Yet, village life had much that was common to every other village.

France, the land of democracy, had in its local government all the merits of an autocracy, not to mention any of the defects. As the character of the prefect, so were the affairs of the department; as the character of the mayor, so was the rule of the village. Once the mayor had his affairs of State safely in hand, his powers were immense, being disputed only by the curé and the schoolmaster with their more limited temporal potentiality. With the houses of a village all grouped together, there was little of the isolation of English and American family life where a man's house is his castle. The Frenchman's home was the property of his neighbors. They were about as "au courant" with what went on within its walls as he himself—more so if he worked long hours in his fields and they kept shop next door. Hence the feuds and many tasks for the mayor and curé who must needs have a share in all. This communal and congested life was no doubt a product of early feudal days when men of necessity lived close together for protection and defense. Thus the Frenchman inherited, together with his towny little village, a dread of living alone and a love of village life and his neighbor's affairs.

The village life was also promoted by the land system which made each man owner of his own strip of land. Thus if a man with thirty hectares of land had six sons, each son automatically became heir to five hectares, which on their death would again be subdivided. Endless subdivision continued until the whole countryside was divided into small strips which, planted in different crops according to individual desires, made the landscape look like a futurist painting. One cultivator might own a dozen or more separate patches scattered around the village, necessitating his spending his time in hand labor and in going from one patch to another. The system tended to make the transfer of land difficult and any one such "terrain morcele" too small to accommodate anything like proper farm buildings. Thus the farmyard, huddled and insanitary, was apt to be in the village. With all the disadvantages of this old system, it probably helped to give the French peasant that independence and stability of character that proved so great a strength to the nation in her days of stress.

Nor were the tradesmen and craftsmen less in-

A VERANDA—CHAUMONT

dependent and sturdy. Crafts and trades were often inherited, passing from father to son. Particularly in the building trades, did one find prevalent a love of well executed work, a pride of craftsmanship and a personal interest in handicraft as opposed to the machine made. A man might win a lifelong repute and live under a halo of local re-

(Continued on page 77)

EDITORIAL

Regaining Knack and Efficiency

FEW men who took part in the late war, either on land or on the sea, either as soldier or sailor, followed in even a limited degree the same class of work they had been engaged in when they took up arms. The question arises whether cessation from a certain type of work, in many cases the result of special training, causes impairment of ability when resumption is attempted, or whether the enforced change from a previous occupation has been in a sense rest, effecting increased vigor and a largely augmented power for performance.

One of the errors in both naval and military administration during the world conflict was that the governments failed to assign men by special selection to a line of duty for which they might be assumed to be well fitted by previous education. Take architects and engineers for example. It is well known that men of unquestioned ability in these two professions were assigned to duties very far removed from work for which they had previously been thoroughly trained. It was not until almost the very close of the war that this error was realized. And after the armistice, in the way of preparation for peace, schools of instruction were started in France and conducted under men specially selected for their ability. The good results have been widely acknowledged. But of that large class of men who were compelled so radically to change their daily activities as completely to disassociate them from former work—what has been the result? Have they resumed their civilian activities better equipped than before, or have they suffered a lack of enthusiasm? It would be interesting to learn the opinion of readers of this journal who have seen service.

THE ARCHITECTS' JOURNAL of London, editorially discussing the matter of "regaining knack and efficiency," states the opinion that it has been the experience of most men that knack and knowledge were more easily lost than acquired. Continuing, it is stated: "In five years or more of disuse, the mechanic lost much of his skill of hand—his 'touch,' his 'knack,' his habit of concentration. In most instances the old mechanical dexterity will be restored through renewal of steady application to the old work. In this comparatively simple matter of handicraft there is no other way, although the craftsman anxious to recover his old form will be less disdainful than it is said that he used to be of the aid of technical manuals. To these he will now turn more eagerly than ever before in the hope that they will show him a short cut to the recovery of his old skill and efficiency. More difficult and more painful is the effort of the professional man to 'come back to his old form.' Not only has much of his laboriously acquired knowledge completely evaporated, but some of that which has remained with him he finds, to his dismay, is incomplete and out of date. He cannot apply it easily to the new conditions that have sprung up during his absence."

Considering the case of the professional man, just how far may the statement that it is a difficult and painful effort for the professionally trained man to "come back to form" be correct? The first impression is that the case is over stated, this impression being formed by association with men who have come back to "form" and in many cases much better form.

Some professional men, it is true, used and developed their knowledge (often in a sea of detail), but these were chiefly in the sciences. Some artists developed out of the material at hand both their technique and their vision. But the architect, an amphibious animal, what of him? So far as the creative side is concerned, he may well be compared with the artists. It is a well recognized fact among painters and sculptors that a complete rest for long periods from application to their art makes for increased efficiency. Even though a painter may lay down his palette and never touch a brush for many months he will be unconsciously studying and analyzing form and color wherever he finds it. Meantime he has opportunity to digest what he already knows, docket it in his subconscious mind, and when

XUM

he resumes his work he finds that he has made progress and has increased ability.

It would seem that every professional man would find the same results through a period of abstention from professional effort, and that no matter what a man's work may have been before he took service under the colors, he would be better fitted to take up that work on his return. Is this reasoning correct?

The Facts About the Car Shortage

WASHINGTON is filled, it is said, with representatives of all classes of shippers who are there to make application for cars. Invariably they are being turned down—hundreds every day—and are compelled to leave the city without obtaining any satisfaction or encouragement. The two committees which have authority over the disposition of all railroad stock, that is to say, the Car Service Bureau of the Interstate Commerce Commission and the Commission on Car Service of the American Railroad Association, find themselves unable to promise anything like immediate relief from the car shortage.

During the war not more than 100,000 cars were constructed, an amount far less than the number of cars retired. And now it is stated that a large number of cars still in service must soon be discarded. Never in the history of America has our transportation system been so nearly broken down.

Just before the closing of its late session, the United States Senate appointed a Committee on Reconstruction and Production. One of the chief duties of this committee is to investigate the causes for the existing car shortage, and for this purpose hearings are to be held in various parts of the country. But most important among the measures for relief already active is that the Interstate Commerce Commission has recommended a loan of $125,000,000 out of the revolving fund authorized by Congress. In order to avail themselves of this assistance the carriers must organize separate corporations which shall advance an amount equal to that loaned by the Government. This they are preparing to do, but it will mean at least a year before the equipment authorized can be made available.

ANOTHER development which seems significant is the purchase of rolling stock by the industrial companies. For, although this amounts to but a few thousand cars, which is but slight relief, still it promises a more immediate effect and gives the car shops which have been operating at about 10 per cent. of their capacity a chance to increase their production.

The situation just at the present time is complicated to the utmost degree. Statistics of many of the roads show that with the limited rolling stock which is available they are handling a greater volume of tonnage than for many years. But there seems to be trouble not only with the shortage of cars, but with the congestion of the terminals as well. Several thousand cars loaded with coal are now at the Atlantic seaboard awaiting export. This tie-up will not be increased, as an order has now been issued prohibiting further exportation of coal; but such an order cannot be prolonged indefinitely, because the Government is committed to the shipment of a large amount of coal to Italy. The Gulf ports, it is said, are encumbered with large numbers of cars of miscellaneous material which await the arrival of steamers before they can be unloaded. Efforts are being made to find storage space in order to relieve these cars.

The condition of the terminals was made worse by the strikes of the switchmen, those so-called "outlaw" strikes which were carried on either as a protest against the delay of the Labor Wage Board or else in the interest of the Plumb plan.

EXTREME efforts have been made to locate equipment in which to handle the crop, and adverse criticism was aroused when for this purpose many cars were sent empty from the East to the grain belt. It was explained that if these cars were loaded for Western destination there would be no certainty that they would not be diverted and become unavailable for the shipment of grain.

The rule prohibiting the use of open cars for anything but the transportation of coal has also created loud protest. It was shown, however, that unless the coal was moved now and stored there would be severe suffering in the coming winter.

On the whole it seems a tangle of almost unsurmountable difficulties. The solution calls for that aptitude in administration and organization which is assumed to be typically American. The public was warned six months back that it must have patience with the railroads during a period of restoration. The public has patience under its inconvenience—lots of it. But the public is impatient to see attack vigorously applied to some vulnerable point of this tangle.

Reconstruction of France

(*Continued from page 74*)

nown because he, Monsieur le Charpentier, had made the wooden cock, the vane that turned on the village church spire. Rather much of a solo performer, the French craftsman liked to do his job in his own way, and what better way could there be since it was the way his father and grandfather

HONEST STONE WORK OF THE MEUSE

and, no doubt, great and greater grandfathers had done before him? Trade unions with rules and hours might flourish in larger towns, but they did not greatly concern Monsieur le Maçon in his little village. Yet among him and his companions there seemed to exist more of that spirit of the old craft guilds that made mediaeval France productive of some of the most beautiful of buildings.

Such are but a few ill-illumined pictures of the pre-war village of Northern France and of the life that went its leisurely course under the slowly warping roof tiles and down their quiet village streets. Whether they are pictures to be restored or not, only time can tell, but certain it is that the world of beauty will be the loser if the picturesque charm produced by their simple building be unheeded and discarded.

Co-operative Art Building

At a meeting of representatives of seven art organizations, the American Institute of Graphic Arts, the Art Alliance of America, Louis C. Tiffany foundation, National Society of Craftsmen, Pictorial Photographers of America, Society of Illustrators and Society of Jewelry Designers, held recently, the plans of a proposed Co-operative Art Building, to house, with offices and exhibition rooms, the Societies above noted, and to afford a much-needed assembly place for all Metropolitan art organizations were discussed.

The purpose of the co-operative building is briefly as follows: To avoid duplication of effort, obtain a common meeting place and exhibition galleries, each society to have its own quarters with a central office and staff. The unity of these organizations will reflect on public taste, inspire a keener appreciation and elevate the standards and usefulness of the crafts, the graphic and the industrial arts to the benefit of the artist, artisan, producer and consumer.

There are now more than 100 seperate art organizations in New York City with more or less common aims, the majority of which have no permanent headquarters, because there is now no central clearing house for the co-ordination of their interests and efforts, and because there is no permanent exhibition and sales galleries for general promotion of their interests.

There are more workers in the various crafts in New York City than in all the rest of the United States and infinitely greater demand for the production and sale of their work. In spite of that, other cities with smaller population, less wealth and demand have large, flourishing and profitable headquarters.

Such a unity of effort will inspire higher standards of art and their application to trade, because such a unity of effort will increase the efficiency of each organization and strengthen the individual aims.

The organization plans to purchase two or three houses in an accessible and central location, to remodel them with exhibition galleries, auditorium, individual organization rooms, central office staff, salesrooms and restaurant.

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Are Apartments Necessary?

An Important Test as to the Legality of Zoning Regulations. Judge Kramer Rules Against Establishment of Apartment Houses in Resident Sections

THE legality of regulation for different types of residence district was tested recently in an interesting case in East Cleveland, a suburb of Cleveland, with a population of about 30,000 administered under the commission form of government. The case arose from the refusal of the building inspector to issue a permit for the erection of eight apartments in a zone restricted to one or two-family dwellings. After a decision adverse to them, according to a report in the *Survey*, the plaintiffs secured a rehearing at which, in addition to the city manager, such authorities as Haven Emerson, former health commissioner of New York city; Robert H. Whitten, adviser of the Cleveland City Plan Commission, and Paul Feiss, chairman of the housing committee of the Cleveland Chamber of Commerce, gave evidence. In sustaining the earlier judgment, Judge Kramer said:

It would seem that there could be no two opinions upon the proposition that the apartment house, or tenement, in a section of private residences, is a nuisance to those in its immediate vicinity. Under the evidence, and as a matter of common knowledge, of which the court may take judicial notice (16 Cyc. 582), it shuts off the light and air from its neighbors, it invades their privacy, it spreads smoke and soot throughout the neighborhood. The noise of constant deliveries is almost continuous. The fire hazard is recognized to be increased. The number of people passing in and out render immoral practices therein more difficult of detection and suppression. The light, air and ventilation are necessarily limited, from the nature of its construction. The danger of the spread of infectious disease is undoubtedly increased, however little, where a number of families use a common hallway, and common front and rear stairways.

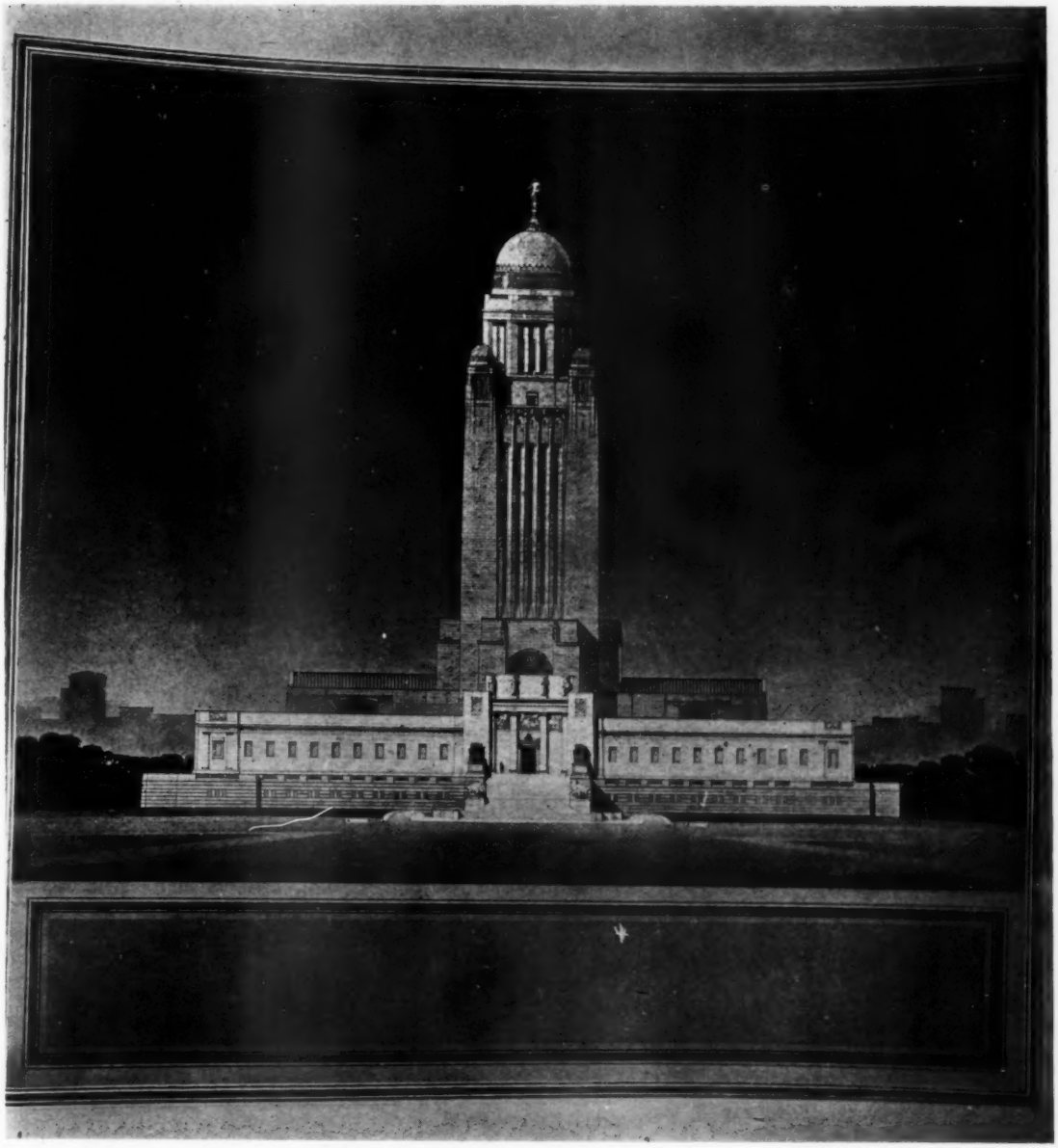
The erection of one apartment house in a district of private homes would seriously affect only those persons living in the immediate vicinity thereof, but the common experience is that the erection of one apartment drives out the single residences adjacent thereto, to make way for more apartments. The result is that, in time, and not a very great time, when one apartment is erected, the whole street is given over largely to apartment houses.

With the growth of its population, it appears to be practically certain that unless restricted, the greater part of East Cleveland will be built up with apartments, and the home owners must choose either to adopt apartment life or abandon their depreciated property, and move out of the city or into its more remote parts.

If the claim of the relator here is sound, a city of private homes, grass plots, trees and open spaces, with the civic pride and quality of citizenship which is usually found in such circumstances, is powerless to protect itself against the obliteration of its private residence districts, by apartments, which shut out the sun and sky from its streets, and one another, and are generally owned by those whose greatest interest is in the revenue that the building will produce. If such is the law, it must be conceded that it is unfortunate.

The apartment house is, for many, a desirable convenience and, for some, a necessity. They are a recognized necessity in cities of any size. Their erection should not be prohibited and, under this ordinance, are not prohibited. Private residences, with yards for play spaces, with grass, trees and flowers, are necessities for people with children, and as much a convenience to the people without children who take an old-fashioned pride in owning their homes, as is the apartment to those who are willing to accept its restrictions for its compensatory freedom from responsibilities. It is at least equally important to preserve the private home for this class as it is to provide the apartment for the first. Under this zoning ordinance, both the private home is preserved and the apartment house is provided.

It seems eminently fair to restrict the apartment builder to a limited area, where his use of his property will do the least damage to others and to the community. The necessities or convenience of those who live in them will be served thus with the least sacrifice of the necessities and conveniences of others. Whatever of the burden arising from apartments there is, will be borne by those whose purposes they serve, and not shifted to the other property owners of the city, to make their property unfit for use as a home.



FINAL STAGE, NEBRASKA STATE CAPITOL COMPETITION

WINNING DESIGN

BERTRAM G. GOODHUE, *ARCHITECT*

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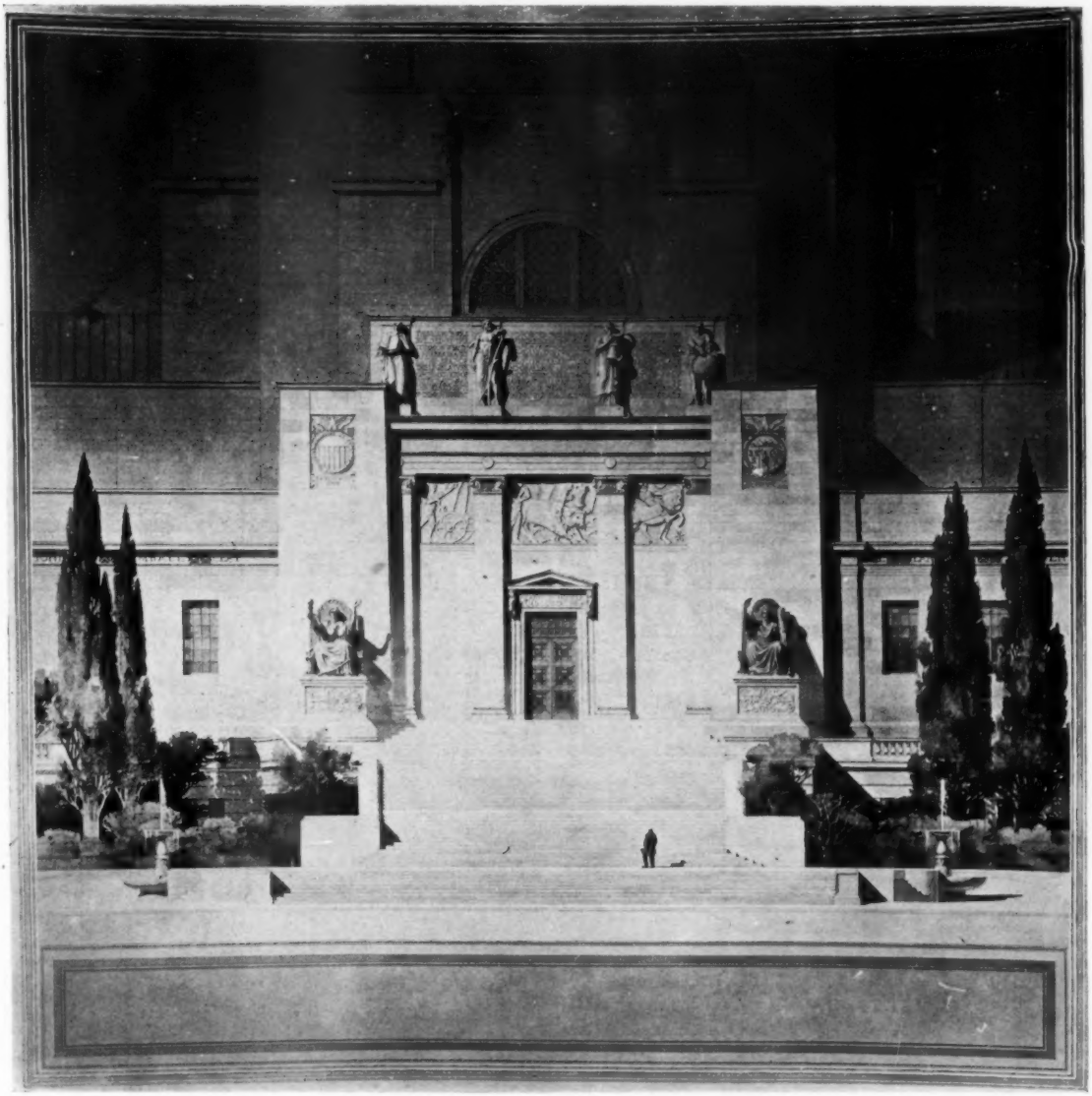

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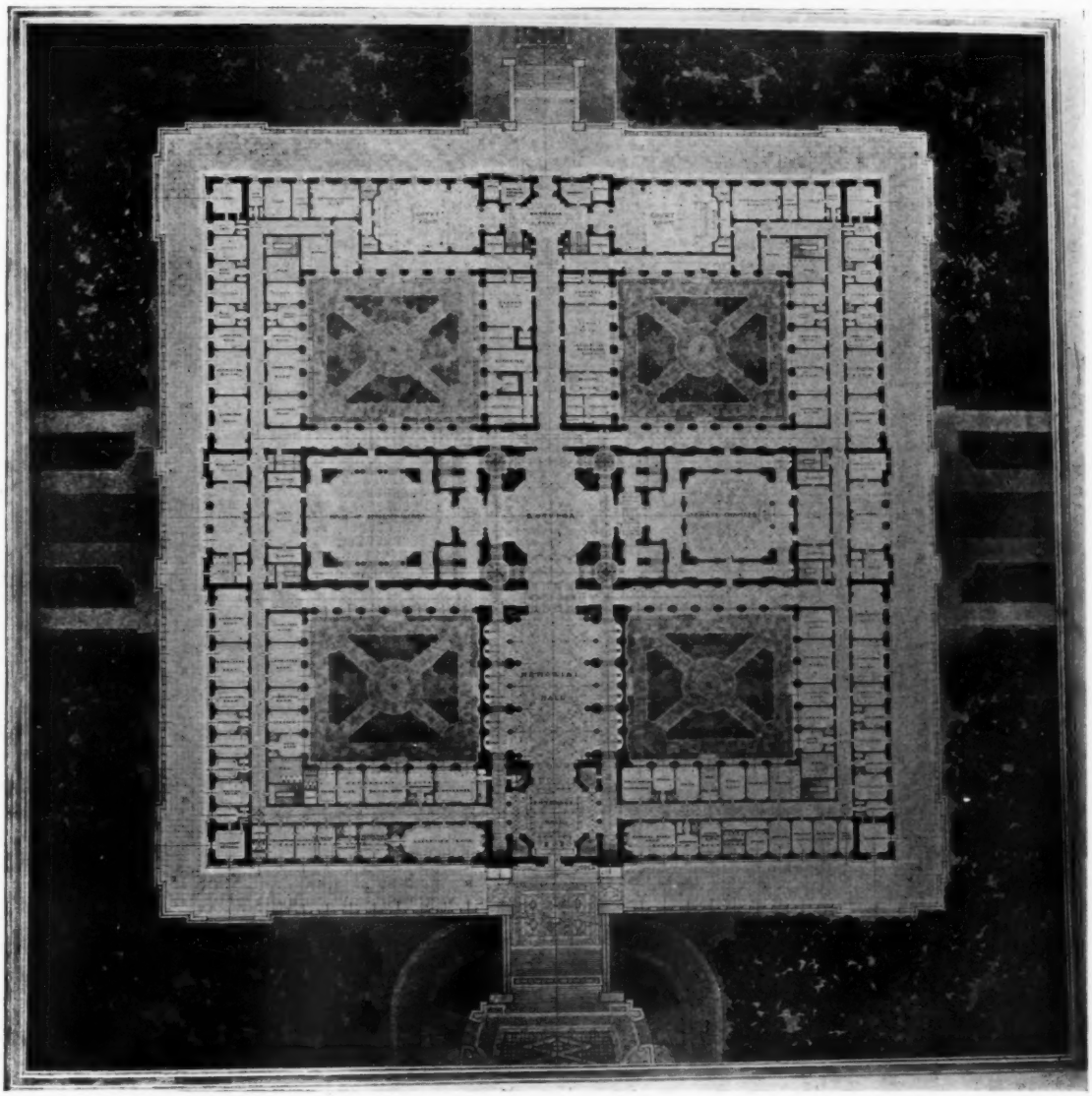

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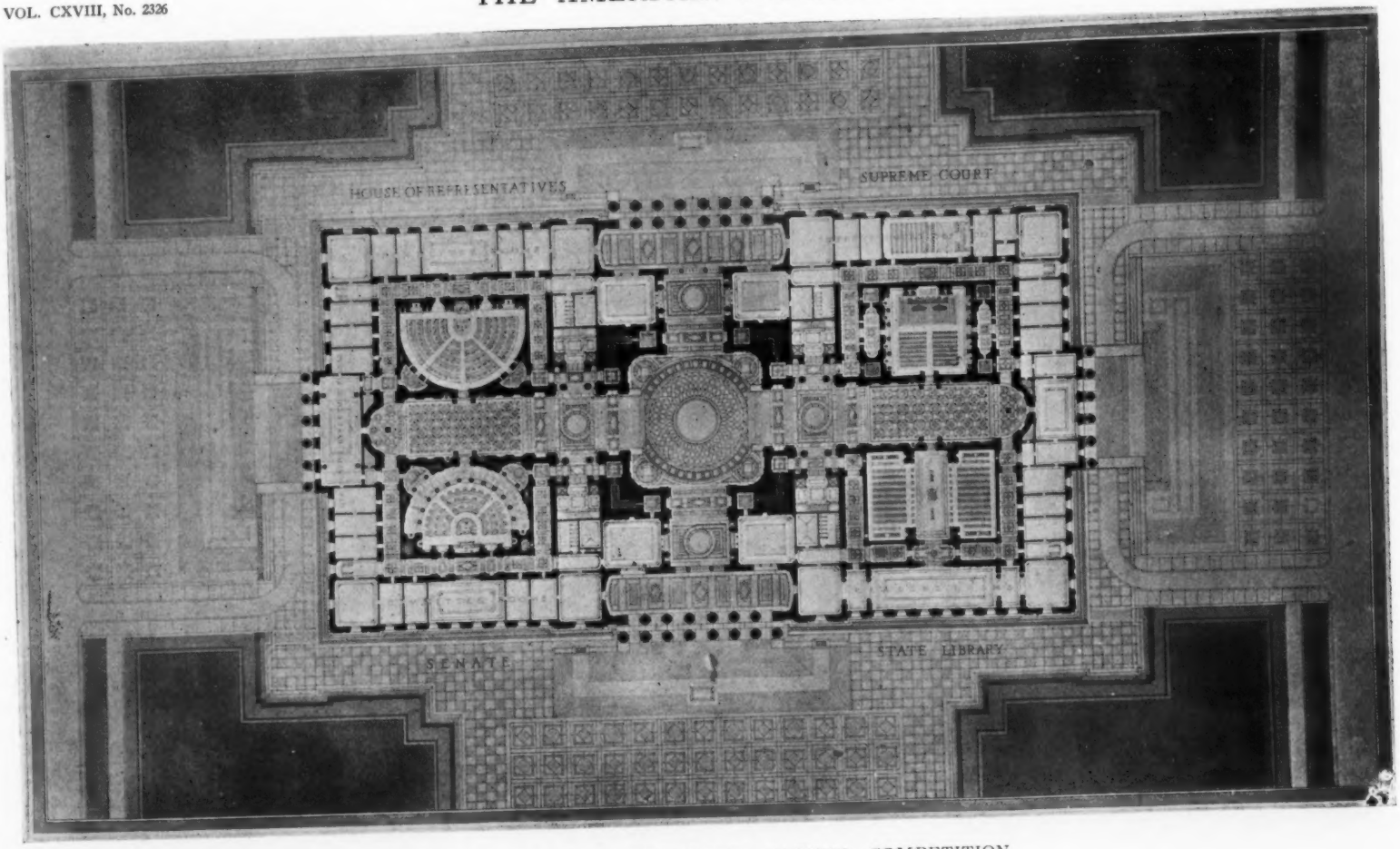
FINAL STAGE, NEBRASKA STATE CAPITOL COMPETITION

DESIGN SUBMITTED BY

JOHN RUSSELL POPE, *ARCHITECT*



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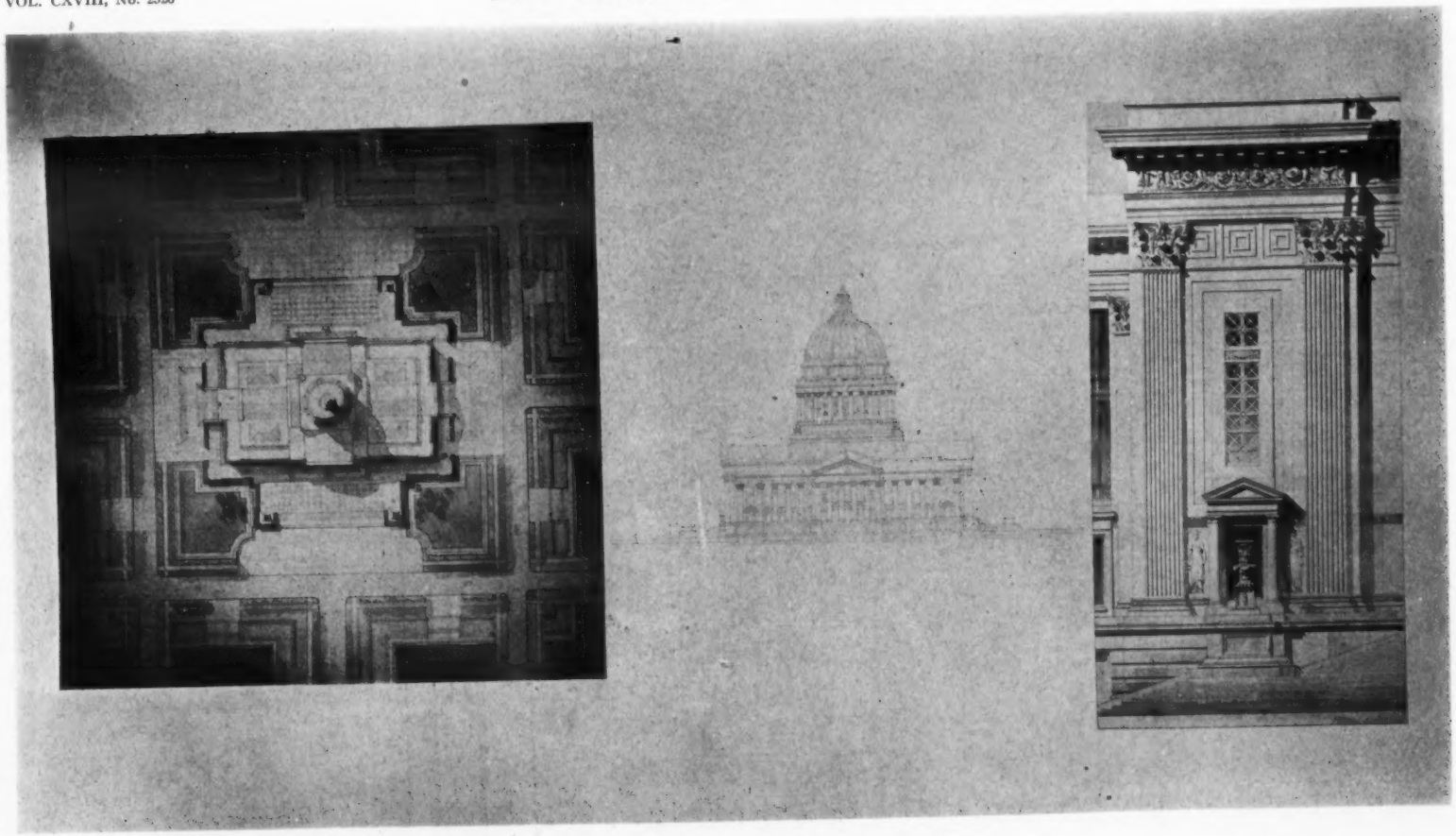

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DESIGN SUBMITTED BY

McKIM, MEAD & WHITE, *ARCHITECTS*

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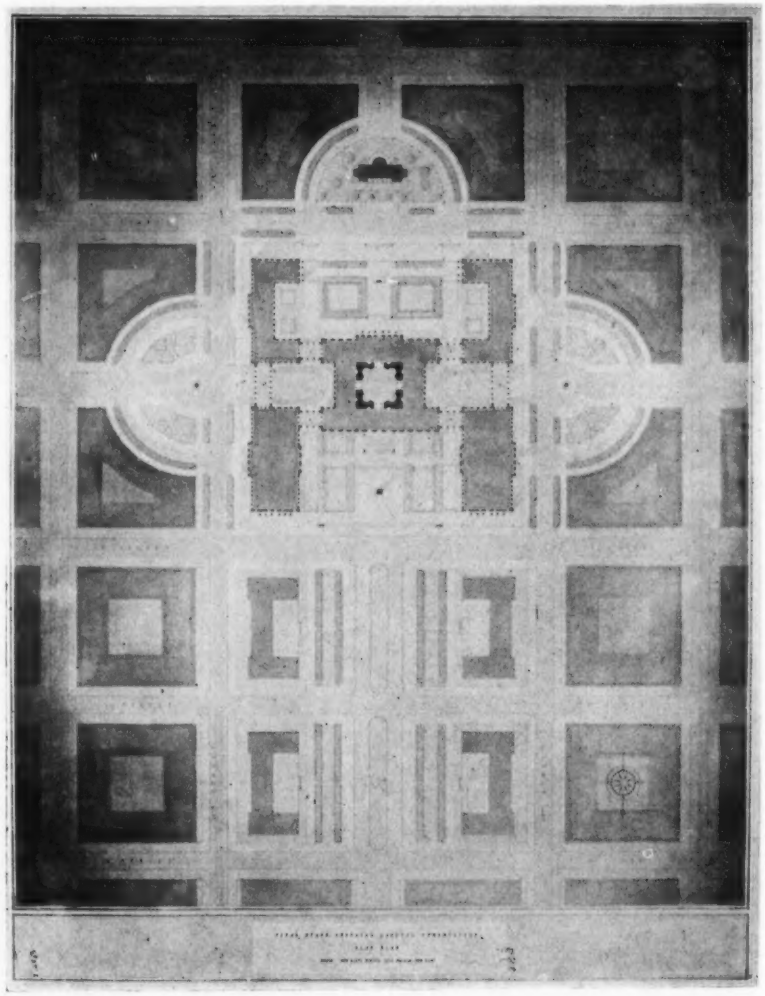
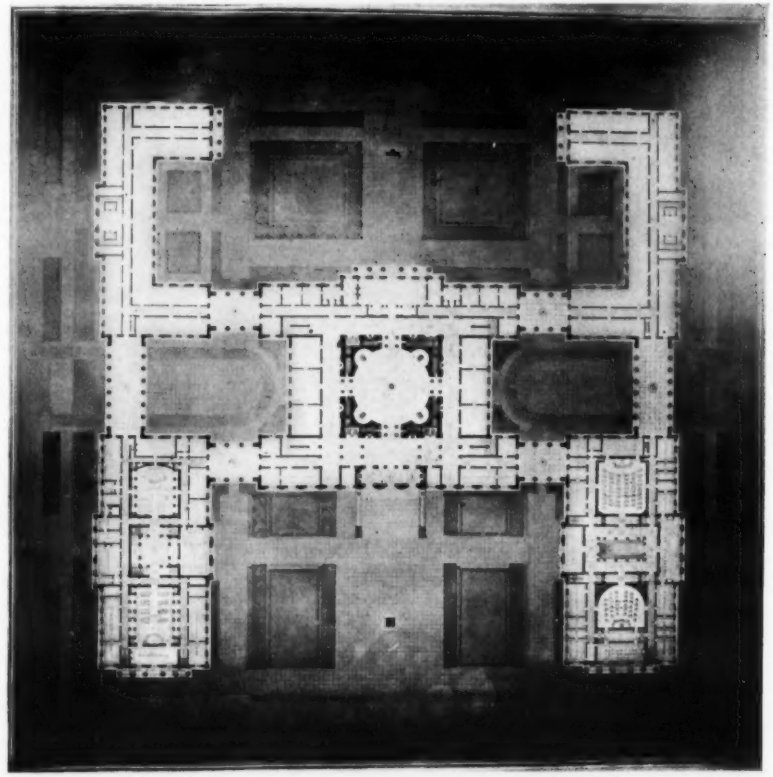


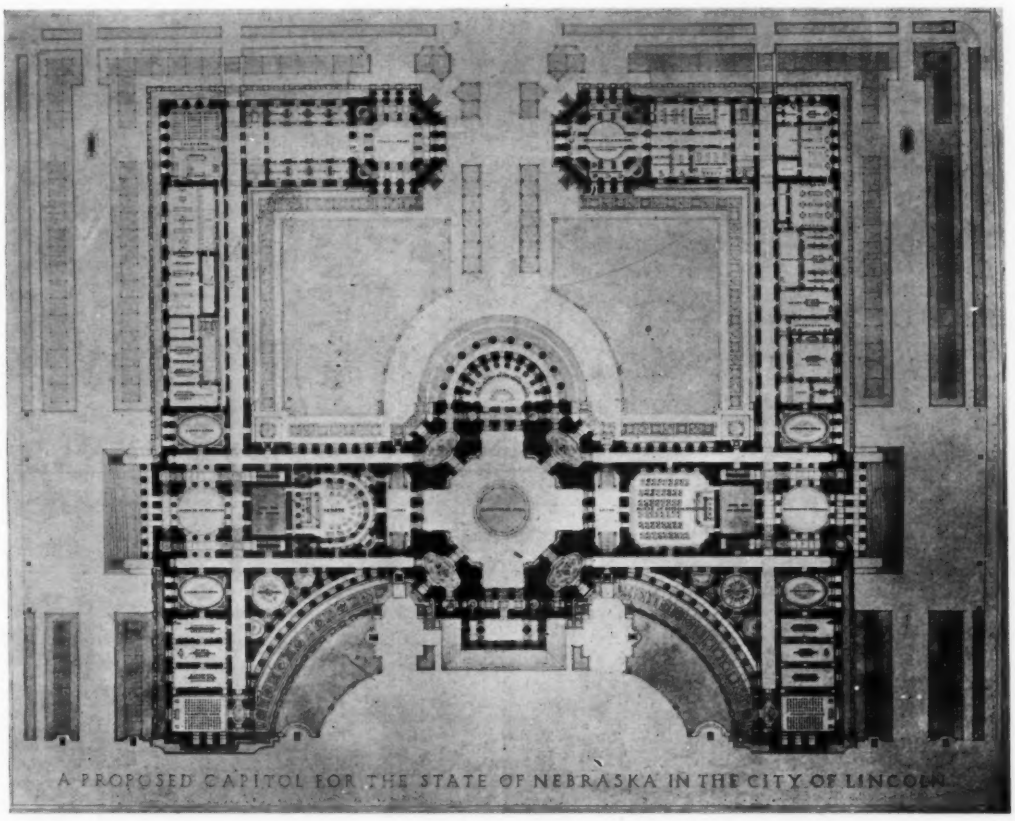


FINAL STAGE, NEBRASKA STATE CAPITOL COMPETITION

DESIGN SUBMITTED BY

McKIM, MEAD & WHITE, *ARCHITECTS*

LIBRARY
THE DETROIT EDISON CO.
JUL 27 1920



FINAL STAGE, NEBRASKA STATE CAPITOL COMPETITION

DESIGN SUBMITTED BY

TRACY & SWARTWOUT, *ARCHITECTS*

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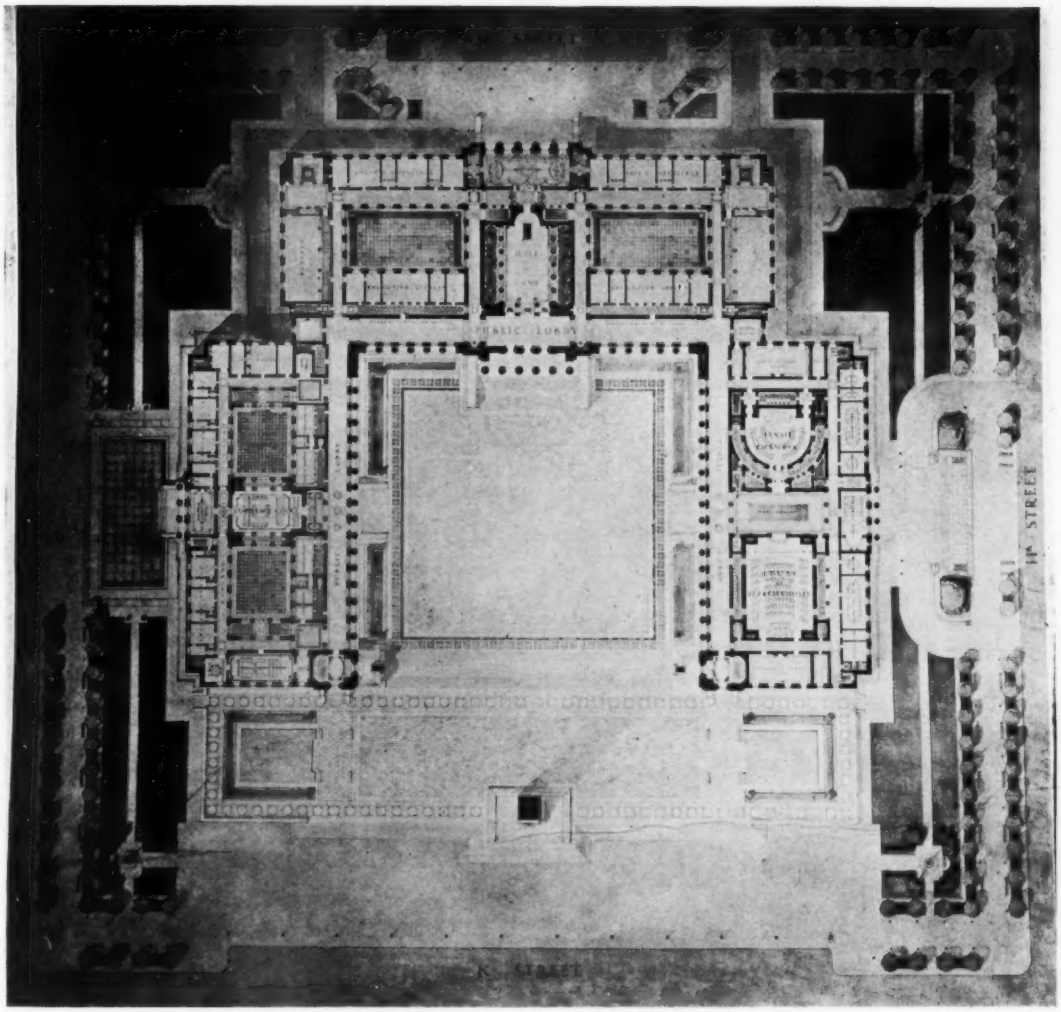

FINAL STAGE, NEBRASKA STATE CAPITOL COMPETITION

DESIGN SUBMITTED BY

PAUL P. CRET AND ZANTZINGER, BORIE & MEDARY, *Architects*

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Nebraska State Capitol Competition

Statement by the Capitol Commission

AS RECITED in the program for the preliminary stage of this competition, the ultimate object of the Commission is to secure to the citizens of Nebraska the best Capitol that is obtainable under present conditions. In adopting a competition as the best means of selecting an architect, the Commission is following what it believes to be the best custom, and in detail is being guided by the usage of the American Institute of Architects, and in accord therewith has appointed Thomas R. Kimball, Architect, of Omaha, Nebraska, its Professional Adviser, and has conducted the preliminary stage of this competition under his guidance.

As to plan, scope, style, type or material, the capitol commission will offer no suggestion. Even in the matter of tradition it is clearly the desire of the commission that each competitor shall feel free to express what is in his heart, unmindful of what has been inherited in this regard, willing even that the legacies of the masters should guide and restrain rather than fetter.

While the commission is very anxious not to handicap the competitors, or to limit the possibilities, it is nevertheless quite clear on much that it seeks to realize in the final result, and is certain to be disappointed should the capitol finally erected not prove to be:

Aims Summarized

First—A practical working home for the governmental machinery of the state; adequate not only for present needs, but with provision made or anticipated for development and growth for a century to come.

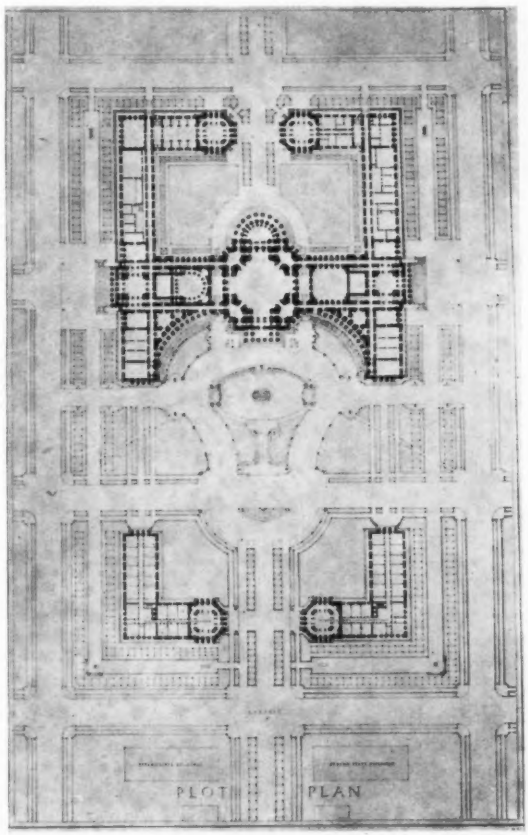
Second—An inspiring monument worthy of the state for which it stands; a thing of beauty, so conceived and fashioned as to properly record and exploit our civilization, aspirations and patriotism, past, present and future; intelligently designed, durably and conscientiously built, and of worthy materials; and all beautifully and fittingly set, surrounded, embellished and adequately furnished.

Third—The whole accomplished without friction, scandal, extravagance, or waste—a work calculated to inspire pride in every Nebraskan.

The commission believes that the following memorandum (New Capitol Requirements) quite accurately represents the requirements of the offices and departments for which provision is to be made, and offers it and the accompanying observations as representing its latest opinion. In studying these suggestions competitors are referred to the accompanying pamphlet by Governor S. R. McKelvie, entitled "A Responsible Form of Government," and marked Exhibit "D," which includes the scheme of governmental machinery now being tried in Nebraska.

Observations on Arrangement

Should a separate housing be suggested for some of the large and growing, though less conspicuous departments, it is pointed out that the monumental or more distinguished group or groups, should still include in addition to the legislative halls, supreme court and library, the offices and quarters for all the elective officials of the state and a war memorial room. However, the supreme court, state library



PLOT PLAN
TRACY & SWARTWOUT, *ARCHITECTS*

and attorney general's office might function perfectly as an independent unit. It is desired that each competitor charge himself with sufficient study of the requirements of state governments in general and of Nebraska in particular to enable him to offer a solution based on his original research and understanding of the whole problem; particularly is this desirable in the groupings of important departments with relation to each other, and of accessory elements with relation to the important units with which they are intended to function.

Purposes of Competition

Here, however, competitors are again reminded that in their solutions they are not asked to make working drawings or even sketches for any purpose other than *to aid in the selection of an architect,* and that the study of the broad problem is far more important at this time than striving for exact disposition of minor details.

NEW CAPITOL REQUIREMENTS.

Senate Chamber (*thirty-three senators*).

For the senate there should be provided about twelve committee rooms with proper dependencies, and reasonable space for visitors.

House of Representatives (*one hundred members*).

For the house of representatives there should be provided about twelve committee rooms with proper dependencies, and reasonable space for visitors.

Legislative References.

For this bureau, which functions only while the legislature is in session, there should be provided at least three rooms—reading room, reference library and stenographer's room.

Supreme Court (*seven judges and three commissioners*).

For the supreme court there should be provided two court rooms, two consultation rooms, ten judge's rooms, with stenographer's rooms attached, one lawyer's retiring room, all with proper dependencies.

One clerk's room to function with main court room and to accommodate clerk, deputy clerk, journal clerk, opinion clerk and stenographer.

An adjoining bookkeeper's room, and receiving and storing room for briefs, blanks, etc. A connecting vault and two reporter's room adjacent to state library.

State Library (*in same building with supreme court*).

A law library of 80,000 volumes, increasing at the rate of 2,000 per year (400 feet of shelving added per year).

The state library should have an adequate reading room with separate rooms for receiving and forwarding, cataloguing, preparation for binding, and correspondence, with five or six small private rooms for dictation and a stack room with adequate ultimate shelving capacity.

Additional Requirements.

In addition to the above requirements, about eighty thousand square feet of floor space seem to be advisable.

The Old Capitol.

The present capitol is a four-story and basement building, of local limestone, in a very bad state of repair; it was erected in 1886, and is today wholly outgrown and inadequate. Its total length is three hundred twenty feet; the central portion measures one hundred by a depth of one hundred and eighty feet; the wings are ninety-five feet deep by one hundred long.

The site is practically level (sloping slightly from the building in all directions), and is generously covered with well-grown trees.

Prevailing winds are from the south in summer, and northwest in winter. The climate ranges between extremes, and the west exposure is hot, dry and glaring in summer. Manifestly the power plant should not be located on the building site proper; suitable locations on trackage and within practical distances are available and need not be given much consideration at this time.

It is estimated that about three-quarters of the traffic approaches from the northwest at present, with the major part of that coming from the west; also that fully one-half of those entering the old building do so by the west door, and about one-quarter by the east door, a distribution likely to continue indefinitely.

Present property lines, topography, neighboring traffic arteries, with car-lines and other public service contracts, will be shown on the Survey (Exhibit "C" herein) and the location in the city is shown on the map of Lincoln (Exhibit "F" herewith).

Attention is directed to French's bronze statue of Lincoln at present on the site. Solutions should consider this monument and suggest for it a proper part in the ensemble, preferably but not imperatively on the building site proper.

Nebraska produces practically no coal, and only minor lines of building material, thus relieving the problem of home-production complications and handicaps.

Current News

Happenings and Comments in the Field of Architecture and the Allied Arts

Landscape Architects Meet

A number of leading authorities on landscape architecture were present at the national conference on professional instruction, recently held in Cambridge. The architects met on the invitation of Professor James S. Pray of the Harvard School of Landscape Architecture, and represented thirteen institutions over the country. Among the delegates were Frank A. Waugh of Massachusettss Agricultural College, who is in the employ of the Federal Forest Service in connection with recreation areas; Professor E. Gorton Davis, in charge of landscape architecture at Cornell, and Professor Frederic N. Evans, occupying a similar position at the University of Illinois.

The conference continued through three days and included an exhibition of drawings and plans by students from the schools represented. One session was for the purpose of appointing committees on instruction, landscape extension, town-planning and publicity. It was decided to make the conference an annual affair, at which the American Society of Landscape Architects would be represented by the standing committee, and by delegates from the schools throughout the country.

After the business session the architects adjourned to the Cambridge School of Domestic Architecture and the party went by automobile to the Arnold Arboretum. Gorham P. Stevens, director of the American Academy at Rome, spoke on the work of the American Academy, and Charles N. Lowrie, chairman of the standing committee of the American Society of Landscape Architects, discussed the professional needs for education in landscape architecture, at the dinner at the St. Botolph Club.

The conference was motored the next day through the Boston Park system. At the final session formal action was taken upon the recommendations of the committees previously appointed. The following-named institutions sent representatives to the meetings in Cambridge: Cambridge School of Domestic Architecture and Landscape Architecture for Women, Cornell University, Lowthorpe School of Landscape Architecture for Women; Massachusetts Agricultural College, Michigan Agricultural College, New York State College of Forestry, Ohio State University, Pennsylvania State College, University of California, University of Illinois, University of Missouri, Missouri Botancial Garden, Harvard University.

Chicago Banker Talks About Credit Rates

At the convention of the Illinois State Bankers, Mr. Arthur Reynolds of the Continental & Commercial National Bank said, in expressing his view of the present conditions:

"There is a reported shortage of commodities all over the world, and holders have the comfortable feeling that as fast as produce, raw materials and manufactured goods can be moved to market, they can be converted into cash with which to pay indebtedness. But we must not make the mistake of thinking that because we have the federal reserve banks we can go on expanding without limitation. The object in creating those institutions was to assist legitimate business, not to foster undue expansion or speculations; in fact they were designed partly as a steadying factor; it was the intention that they should call a halt when necessary to correct a situation that might be getting unhealthy; and they were also intended as a resource to which the individual banks could apply for help in meeting the seasonal ebb and flow of industry as a whole.

"Up to now, in our orgy of general expansion and extravagance, the thought seems to have been common that credit was limitless, like air; that all the producer of raw materials had to do was to find a purchaser who would promise to pay almost any price and then ship the materials, that the manufacturer could do the same, and that the retailer could follow their example. The opinion seemed to be that the banks could supply the credit without any limitation whatever as to amount.

"But the cheap credit policy as a means of stimulating production and lowering the price level has been a complete failure. Fifteen months after the armistice, the loans of the reserve banks were $800,000,000 more than in the preceding year and upon the basis of these enlarged reserves the commercial banks had expanded their credits to several times that amount. The treasury continued to place certificates at low rates for more than a year and the

XUM

ease with which money was obtainable contributed to fundamental extravagance and all the machinery of war, except troops, was maintained. The railroads continued to be run at a loss. The cry for a bonus to soldiers was raised and production was not increased.

"Suddenly we find that cheap credit is an illusion and we proceed to make credit dear. The reserve bank's rates are increased and then increased again, and they may be increased again. Sliding scales are adopted in some cases to penalize heavy borrowers. The treasury rate on its new issues of notes is advanced to 5 per cent. and then to 6 per cent."

Government-Built Workmen's Homes in New Zealand

The Prime Minister of New Zealand has announced that good progress is being made in carrying out the law, passed at the last session of the legislature, which provides for the erection of workmen's homes in the different centers of the Dominion. One hundred and eighty-three houses are now in course of erection and 122 additional under consideration, with several other centers to be canvassed, including the city of Auckland. Of these dwellings, 113 have been or are being erected at Wellington and suburbs. These homes are being built by the Government and sold to workmen at cost, with the privilege of paying in monthly installments.

The Prime Minister stated that he is satisfied there are more buildings in course of construction in New Zealand at this time than ever before in the history of the country; and it would seem that this is but a beginning of the general move for the development, not only of the business and industrial centers of the Dominion, but for the smaller cities and towns, as well as rural districts.

The cost of building is so high in New Zealand that private capital is not attracted to the erection of homes, so the Government is assuming the responsibility. Five years ago Oregon pine sold here at $3.53 per 100 feet, while now it sells at $14.60. Redwood has advanced at about the same ratio, and Australian lumber is expensive and hard to get at any price. A good grade of English corrugated iron sells at $404 per ton of 2,240 pounds, and nails at $263 per ton. It is stated that a home that would have cost $3,000 to build before the war would now cost more than $5,000.

To improve Grand Central Station ten stories will be added to Grand Central Station, New York, for office space, according to Whitney Warren, of Warren & Wetmore, architects.

Wood Construction in "Shamrock IV"

The wonderful strength of carefully selected, well-seasoned and properly disposed wood is emphasized by the designers of Sir Thomas Lipton's challenging yacht, "Shamrock IV," as quoted in an article in a recent "Scientific American" which gives the leading characteristics of this craft. The international yacht races held July 15 have arrested widespread attention, as in former years.

Although "Shamrock IV" is of practically the same displacement as the cup defender "Resolute," it carries 25 per cent. more canvas or 10,800 square feet as against 8,650 square feet for "Resolute." "Shamrock IV" is a boat of great initial stability, capable of carrying a huge spread of canvas—its spread of sail reaching 170 feet above the deck—and this ability is due, according to its designer, to the "wonderful strength" of the wood. The hull is sheathed with three layers of mahogany, two layers inch thick, placed diagonally in opposite directions at 40 degrees to the vertical, and an outer layer 5-8 of an inch thick, placed longitudinally, the whole being very thoroughly fastened together with the joints evenly distributed. The deck is of birch veneer, 5-8 of an inch thick and the hull is stiffened against distortion by running birch veneer bulkheads at each web frame from the bilge to the deck along each side of the hull. The hull is also stiffened longitudinally by a series of wood longitudinals, about 2½ inches square in section.

The mast, two feet in diameter, is of wood and hollow, as are the other spars. The topmast truck is 145 feet and the top of the clubtop sail 170 feet above the deck. This means that if Shamrock were afloat on Broadway the topmost point of her clubtopsail would be level with the cornice of a 14-story building, and this, on a waterline of 75 feet.

New York Society of Architects

About three dozen members of the above-named society had a most enjoyable outing on June 30 to Bayville, L. I.

Leaving the Society's headquarters, West 39th Street, at 10 a. m., the party proceeded by motor bus via Queensborough Bridge, Jamaica, Hollis and Oyster Bay—a three hours' ride through some of the most picturesque scenery in this section of the country. The weather was propitious and the season of the year at its best.

After a refreshing dip in the clear and cooling waters of the Sound—so far as the somewhat limited supply of bathing suits would allow of it—full justice was done by members to a liberal and varied

repast. This was followed by a game of baseball, and the skill and agility displayed by some of the older men, who it is safe to say had not handled a bat for 20 years or more, was as remarkable as it was gratifying to behold.

Genial humor nd good fellowship were the order of the day, and it was felt on the whole that the time could not have been better spent than it was; the hope being expressed that a recurrence of the occasion might take place in the near future.

Church for Children

CZECHOSLOVAKS of New York City have established a church solely for children, with a children's choir and orchestra and child ushers. Its doors are open only to those under 15 years, with the exception of the pastor and organist.

Look in on the Bohemian colony over on the upper east side of New York any Sunday morning and you will see scores of little girls in stiffly starched white dresses and as many small boys with their hair slicked back and shoes carefully polished making their way toward the attractive little stone church at 374 East Seventy-fourth street. They don't have the doleful, "wish-it-were-Monday" appearance customary with youngsters being dragged unwillingly to church by their parents. They look as though they expected a good time.

When 300 children go to church regularly every Sunday in the year, one can be sure there is something unusual about the service. The pastor, the Rev. Albert J. Murphy, boasts that it has all the elements of a regular Presbyterian church service from invocation to benediction, but he has skilfully adapted it so that it will be attractive to the young mind.

The church—Jan Hus Church, it is called—is the kind of a place any one feels more cheerful for being in, especially the light-hearted Bohemians, whose mother country has endowed them with a love of the gay and vivid. The panels of the walls are decorated in Czechoslovak fashion, with brilliantly colored designs. The painting was done by one of the neighborhood men, by trade an ordinary artisan, but with the unerring skill and feeling for color of the true artist. His work has made of the church a place full of life and beauty. No wonder it is the mecca for all Bohemians who live in the eastern part of the country.

To come to the children's service—at nine-thirty on Sunday morning when the little ushers in their stiff Buster Brown collars have finished their task of seating the congregation, the boys' choir, thirty strong, enters marching in processional. It is one of the finest boys' choirs in the city, having as its director Francis Pangrac, a Metropolitan baritone.

The stringed orchestra, which supplements the choir, is the product of the Jan Hus Neighborhood House, which is conducted in connection with the church. This is one of the United Neighborhood Houses of New York, a federation of forty-seven settlements. It is the community centre of the 30,000 Bohemians who live in the district, the place where the young people come for athletics, dancing, lessons in cooking, arts and crafts and music; the older generation, to learn English, to dance the folk dances of their beloved Bohemia, or just to enjoy one another's society in the comfortable clubrooms.

To return to the children's service—what of the sermon? There are no dry, doctrinal harangues in the children's church. Mr. Murphy has solved the problem of retaining the sermon and yet keeping his youthful congregation interested.

"Preaching and moralizing are horrible," he says. "It is much better to let the children draw their own lesson from some interesting tale."

So he tells them stories, sometimes old Bohemian folktales translated into English, sometimes a Bible story, and sometimes a modern story.

Westminster Abbey in Need of Repair

But little attention was paid to the needs for repair in Westminster Abbey during the war and it is now estimated by the Dean that it will be necessary to spend as much as $500,000 to put the structure in a condition worthy of so dignified and revered a monument. The sum fixed for maintenance of the Abbey some fifty years ago is quite inadequate and the Dean, in his appeal for funds for repair, has asked for £150,000 in addition to be used for the establishment of a fund which shall keep the building in a constant state of efficiency.

It may be the vibration from the continual and constantly increasing traffic, or it may be the natural result of age which makes constant attention and renovation necessary. At any rate, great masses of decaying stonework are badly in need of reconstruction and the authorities are without funds. Although the abbey was started so long ago as when there was a King Sebert of Essex, and that was in 616, it isn't so old that it should be permitted to fall apart—not yet. The King has headed a subscription list with a donation of £1,000.

War Memorial in Ten Years

After discussing details as to the most recent of several ineffective conferences held in New York by the Mayor's War Memorial Committee, the New

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York *Times* recommends that the example of Paris be carefully noted.

That city is perhaps the most spacious, orderly and harmonious in the modern world. The French have in full measure the instinct and the skill for monumental works of art. Yet they have lately decided not to begin the planning and construction of their War Memorial until after the lapse of ten years. As the Jury of Artists well says: "Only time can develop the full strength of the artistic talent and imagination of the community." To settle the fate of so momentous a project forever at a meeting held at the end of July would be, all too literally, midsummer madness.

Moneybag Decoration

The statement of the president of the Incorporated Institute of British Decorators that the Institute desired to direct decorative art into a thoroughly English channel and to restrain it, because there is a danger that decoration may be carried out under the orders of war millionaires, whose money may be in excess of their taste, opens a subject of speculative interest in these transitional times, states the Glasgow *Herald*. What exactly is meant by directing decorative art into a thoroughly English channel we confess we cannot understand. Heaven help the art, or the people fated to live with it, which is "thoroughly English." But we presume it to be the intention of this body to encourage the development of English tendencies in art and to permeate whatever of "foreign" art as may be introduced, with the traditional spirit of the environment and setting to which it may be adapted. The point of interest, however, will be to watch the conflict which is sure to come in the artistic world between those whose work has been strengthened and tightened and steeled by the fact of war and the artists whose works will be produced to meet the demands of a new public, largely an uneducated public so far as art is concerned, and a public with moneybags.

History shows that the transference of wealth which follows all great national struggles and upheavals, and the consequent change of patrons of the arts, has reacted on art in a manner which has in the long run proved beneficial to the progress of much that is best in art, including the decorative branches of it. Be that as it may, we nevertheless sympathize with such members of the Incorporated Institute of British Decorators who come into actual contact with the war millionaire who dreams of possessing a succession of glittering and gaudy salons in the rococo style, and is ushered in by his decorator to quiet rooms panelled in the tones of Morris. It would almost be as dangerous as condemning the furs of his wife in favor of a Greenaway cloak. That is, of course, taking the war millionaire at the Decorators' estimate. Nevertheless it is a scheme on the right lines and one that could well be applied to more than the newly rich. But the greatest influence which will counteract extravagance in affairs of art lies in the war-tempered school to which we have referred.

Builders Advocate Lower Structures

Building skyscrapers on their sides, instead of one end in the air in order to save the tremendous cost of foundation and enormous elevator equipment, also to spread business districts of cities over a wide area, was discussed at the recent annual convention of the National Association of Building Owners and Managers in the Twin Cities.

Low buildings in the business district was the theme of a paper on "Analysis of the comparative investment value of office buildings of various height," was read in Minneapolis by Edwin S. Jewell of Omaha.

Jewell advocated the building of low buildings in place of the sky-scraper thereby spreading the business section of a city over wide territory.

Pointing out that land values comes from the size of population in a section and not from the buildings put on it, he declared that low building on large lots were more profitable than a structure towering in the air.

Other papers of the afternoon were read by Adrien W. Vollmer of Philadelphia on "The ethics of office building ownership and management," and by Colonel Gordon Strong of Chicago on the "Fundamentals of the office building business for profit."

How One Library Serves Its Public

It's a dull day in Newark, New Jersey, editorially comments *The Sun and New York Herald*, on which John Cotton Dana does not find a new way to make the public library more useful. One of his recent exploits is a scheme to "Get Wise Quick," which is "addressed to young people; but men and women will find it useful if they wish to begin again to learn." To get wise quick, of course, the ambitious youngster or adult is to make intelligent use of the public library, of which the bulletin issued on this subject says:

"In your library are 240,000 books. In these books lie the sum and substance of all the wisdom getting, memory improving and salary raising ideas that anybody has ever had since the world began.

"And in your library are persons who jump at the chance to pick out just the books and parts of books that will best help you to just exactly what you want to learn.

"Their work is paid for already."

Mr. Dana would like to have the potential stu-

dent come to the library, but for those who cannot manage to do this he has prepared a card to be filled in and mailed by the would-be student. On this card the librarian says:

"Mail this card in an envelope if you so prefer. Why not write a letter telling what you have studied, and what trade you have worked at? This is all confidential, of course."

The library encourages those to whom it appeals by telling them that it has "learned, what thousands of self-taught citizens have proved, that every man or boy or girl is his own best teacher." There is no attempt to mystify or to awe the prospective delver after knowledge; he is not approached as if he were a suitable object for charitable treatment; there is no hint of patronizing in this circular advertisement of "the biggest academy in New Jersey, with the best staff of teachers in the world (the writers of the 240,000 books and with the finest student body you can find—yourself.

If Newark's population does not attain intellectual supremacy over all the other people in the United States its failure cannot fairly be laid at the door of the public library.

New Kind of Artificial Stone

Consul General Yeo J. Keena reports from Zurich, Switzerland, that the Gyr-Guyer Bank for Financing (Gyr-Guyer Banque pour Financements) of Zurich states that they are holders of a Swiss patent for the manufacture of a kind of artificial stone which can be made at one-third the cost of ordinary artificial stone. A description of this stone and a report of an examination of it made by the Examing Board of the Federal Laboratory for Material Analysis, at Zurich, may be inspected at the Bureau of Foreign and Domestic Commerce on referring to file No. 8492.

A Recent Book By John Nolen

A new book by John Nolen is always a matter of interest in the town planning world. His latest book, "New Ideals in the Planning of Cities, Towns and Villages," is really a primer of town planning, written as it was for use in the Army Educational Course with the boys "over there." The book has the great advantage of being attractive in form, being small and something that one can slip into a coat pocket and yet being very comprehensive and attractive in appearance. It is pointed out that the book is not a dissertation on "City Beautiful" vagaries that look well on blue prints, but which never get themselves adopted, but is a thoroughly practical book that coordinates industrial and business needs with the best thought on beautification. It reflects not only a faithful history of the city planning movement, but is as well a text-book for methods of procedure. In it Mr. Nolen discusses such topics as Specific Needs of the Smaller Cities, City Planning Misconceptions, How to Replan a City, Controlling purposes of a City Plan, How to Get a City Plan into Action, Does City Planning Pay, and a number of similar important phases of the city planning movement.

The book is published by the American City Magazine, Tribune Building, Nassau Street, N. Y. City.

American Wooden Houses in France

Five hundred from an order of 1,000 wooden houses for the devastated regions of northern France have been delivered by a New York firm this spring. These houses are 7 meters or about 23 feet square and have three rooms and a shed. They are delivered in sections and complete, according to the Review of the American Chamber of Commerce in France, including windows, doors, glass, paint, nails, bolts, all ready for erection. Their erection is under the directon of one of the French building departments. About a hundred of these houses are being erected in the Arras and Lens districts.

Art Restoration Planned

Arrangements are under way to restore the 150 portraits of the signers of the Declaration of Independence, members of the Continental Congress and other celebrities of Revolutionary days, which are now stored in one of the upper rooms of Independence Hall.

"These paintings," said Joseph C. Wagner, acting Director of Public Works, "are valued at over $500,000, and for the sum of $10,000 they can be restored. We have $1,000 available for the purpose and I propose to ask City Council to appropriate additional money for the purpose."

The work will be done by Prof. Pasquale [illegible].

Housing Brevities

Housing Plans for Railroad Employees

Plans for building homes for employees are being considered by the Pennsylvania Railroad. Their plan provides for the construction of houses, either singly or in groups at division points and terminals. The houses would be rented to the employees or sold to them at the cost of construction. Railroads have difficulty in getting labor, frequently because the men cannot secure living accommodations.

The laws of some states, however, do not allow the railroad corporations to engage in the real estate business. The lawyers say, however, that if the houses are used exclusively for Pennsylvania employees on a cost basis, the legal barrier might be overcome.

The Pullman Company built the town of Pullman and rented houses to employees. The state attacked the plan and the courts ruled that the company could not engage in the real estate business and accordingly the company sold the houses.

Revised Edition of "Model Housing Law"

When Lawrence Veiller's book, "A Model Housing Law," was published five years ago it was to a large extent a pioneer effort; for, at that time there were no housing laws in the country, but only tenement house laws, most of which had been modeled upon the New York Tenement House Law.

Since then, through the activities of the National Housing Association, housing laws have become firmly established in many states and the country has accepted such legislation and no one outside of New York City thinks any longer in terms of tenement laws.

The experience of the past five years in adapting the Model Housing Law to the varying conditions existing in different communities has developed many important and new features in housing legislation.

The result of this experience has been embodied by Mr. Veiller in a Revised Edition of this book which has just been published.

The Revised Edition is almost a new book, for many changes have been made in the law.

To those who are not interested in legislation but who seek information as to what should be the housing standards that should prevail in their community this book should prove of value. The law itself serves as a set of standards and the copious notes and explanations with the reasons for the adopthrow much light upon the reasons for the adoption of a particular standard.

In addition the author has included in the Revised Edition a new chapter on "Housing Standards" and has included there the verbatim text of the "Housing Standards" adopted by the Federal Government of which Mr. Veiller was the chiaf author.

He has also included in the book a new chapter on "Zoning" and has accompanied it with a Model Zoning Enabling Act to be adopted in large cities before zoning is attempted.

The book can be obtained from the publishers, the Russell Sage Foundation, 130 East 22d Street, New York City—380 pages.

More Hotels for New York

Plans for doubling the size of the Hotel Commodore here to 4,000 rooms, making it the largest hotel in the world, were announced by John McE. Bowman, proprietor. Mr. Bowman, who owns several hotels here, also announced that a new 3,000-room hotel would be built on the site of the Murray Hill Hotel. Mr. Bowman recently sold the Manhattan Hotel to the National City Company, which will convert it into an office structure.

Dividing Old Houses

IT IS a significant and gratifying fact to notice, among the permits for building granted in the last few months a large number of "remodeling and alteration" permits, where old homes are being made up-to-date or changed into apartments, housing two or three families where one was housed before, and tending to do away with the much-mooted question as to why so many large dwelling houses stood idle and dusty while the clamor increased for homes. This fact was recorded by E. E. Hollenback, President of the Master Builders' Exchange in Philadelphia.

In a time when building materials are subject to so much delay in transportation and prices fluctuate almost with the temperature, it is a wise move to make habitable houses already built, make two homes grow where but one was before, and help to house the working force of this country, who cannot, of necessity, produce more unless comfortably sheltered.

Weekly Review of the Construction Field

With Reports of Special Correspondents in Prominent Regional Centers

Slight changes are evident during the past week in the construction industry, if indeed there be any change. The general trend in regard to labor seems to be toward a more free supply which was to be expected as a result of the shortages in material and the impossibility of pressing forward work now on the way or already started.

The chief interest of the builders at the present time is to get their materials. Prices have been so erratic that practically all work is done on a cost-plus basis and speculation as to whether prices will come down or go higher is beside the mark, the question is whether or not the building materials can be obtained. This is dependent on the transportation problem and hardship is felt as it has been felt for months. Several cars just arrived at Toronto have been twelve weeks on the way from Pittsburgh, so it is told. Every contractor has similar stories to tell, and only too frequently the difference in his story is that the cars haven't arrived yet.

Now a question seems to be coming to the fore as to whether the manufacturers will be able to accumulate enough coal to keep running. Opinions as to the facts seem varied by the expression of one coal operator that there was no shortage of coal. Possibly not and it is comforting to suppose that General Order No. 7 which restricts the use of open top cars to the carrying of coal has had something to do with achieving this consummation. There is being held in Washington, at this writing, a conference between the coal operators and the railway executives.

There is but one certain solution to the car shortage and that is to build more cars; it is quite as simple as the solution to the building shortage. Which is very easy to say and to put on paper. But quite apart from the realm of gentle criticism is the announcement of straight fact that the manufacturers of lime have closed down for lack of coal. And that there is talk among the steel mills of suspending operations to permit a clearing away of the congestion. Iron Age estimates stocks of finished material awaiting shipment in the Pittsburgh, Youngstown and Shenango districts to aggregate 1,000,000 tons.

(By Special Correspondence to The American Architect.)

San Francisco.—With the National Democratic Convention in full swing throughout the week, the minds of San Francisco people have been more on politics than upon pushing plans for new structures. The most important development of the week has been the letting of contracts for the steel and some other parts of the twelve story and basement Class "A" building to be erected by the Standard Oil Co. at Bush and Sansome streets on the plans prepared by George William Kelham. The building will cost approximately $4,000,000 and an interesting feature in connection with the project is the leasing of the ground floor for a term of fifty years to the Anglo and London-Paris National Bank for a total rental of $2,000,000. This bank is now located at Sansom and Sutter streets and it has acquired the property between its present site and the new Standard Oil building upon which to erect a building connecting its present quarters with the Standard Oil building.

Buildings constructed of adobe are coming into some popularity in the southern part of the State. W. H. Austin, a Long Beach architect, says of this material: "The adobe house lends itself to attractive architecture. It is a material which is most artistic. The architect can use ideas which would not work out so well in a frame construction. It seems to me that adobe houses would do much to relieve the present difficulties and at the same time would have such a variety of architectural expression as to be a distinctly beauty asset."

(By Special Correspondence to The American Architect.)

Seattle.—Rationing of steel building products, including nails and small pipe, must continue in the North Coast jobbing territory until the eastern mills are able to secure competent production. This is the opinion of jobbers as expressed this week. Hope for relief in that direction seems remote, as several of the larger mills have wired that, due to incompetent labor, they are expecting to close down.

Prices, however, are holding steady, and the talk is not for lower quotations, but none feel that they will advance due to the liberal offerings in comparison with the demand. Building seems to be at a standstill, and no new jobs of moment have come out of the hands of architects during the past thirty days.

There is a keen shortage of three-quarter inch pipe. Black pipe of an inch and two inches seems to be plentiful, if a dull demand can balance against a light supply. Sizes of 1½ and 2-inch pipe are

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short and lots badly broken. North Coast jobbers are of the opinion that the threatened close down by the mills for 60 days because of shortage of labor is more than of a commercial nature.

Shortage of materials seems to be caused more through light production than the car shortage, although both are serious enough.

Screws are plentiful, but small nails are being rationed out through the entire territory, particularly in staple sizes. Jobbers say there would be more buying if the material was here.

Because of the high cost of tile, builders are making enquiry and experiments with hard plaster for bath rooms. Results are being watched with much interest.

Moulding plaster, with Kansas as the shipping source, is scarce. White cement is just coming through from York, Penna. Fire brick is slow. Plenty of patent roofing is now being offered.

Real estate is dull and there is an increasing number of houses for sale, but not for rent.

Fir lumber is steady. A new price list issued by one of the largest mills with its own selling agency carries quotations of $26.50 for No. 1 common dimension, $77 for No. 2 vertical grain flooring, $54 for No. 2 and better slash grain, $51 for drop siding, $29.50 for boards and shiplap and $7 for lath, all as a basis to the eastern trade at the mill. This, however, is practically what wholesalers have been quoting for ten days. The mills and logging camps have closed for the early July period, and declare they will not resume until the railroads can definitely promise relief in the car emergency.

(By Special Correspondence to The American Architect.)

Boston.—Construction work continues hampered by lack of money, material and transportation, while industrial plants are confronted with the possibility of shut down due to shortage of coal and cars for the bringing in of raw materials and the transportation of finished products.

Various housing projects, though, are under way: one in Worcester with a contemplated expenditure of $1,500,000 and averaging around $6,000 per dwelling was started this week.

The delay in bringing the much-needed coal into New England can be laid at the door of the Interstate Commerce Commission which under a recent act was directly charged with the responsibility of meeting transportation emergencies. Although they have issued a so-called priority order, up to the present writing they have taken no practical steps to ward off the approaching coal crisis.

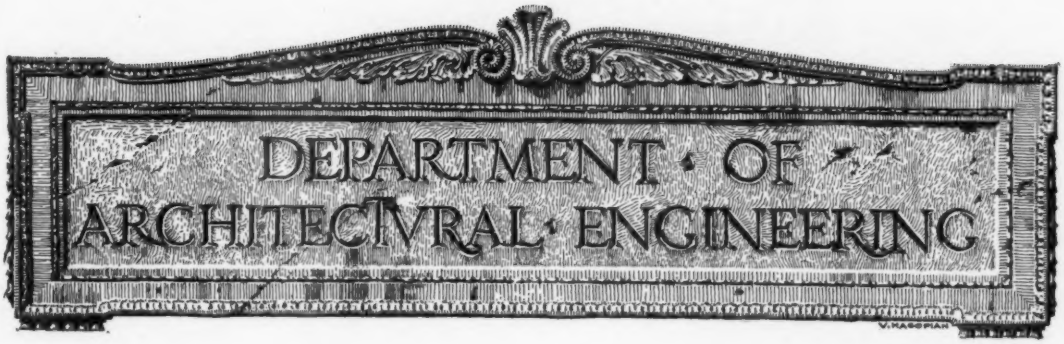
With a return to more normal transportation conditions brought about by an increased supply of coal and cars, building construction should gain a decided impetus. Reports show that there is an ample labor supply: meaning competition for jobs and a more nearly normal production.

The restrictions in business circles are beginning to make themselves felt in decreases in the volume of clearings at the various clearing house centers throughout the country. Until a few weeks ago, it was customary for clearings to show a substantial increase week after week as compared with the previous week. That was partly because of more active business and partly because check transactions passing through the banks were swollen by the rising commodity prices. In New England, in the first five months of this year, clearings were 24.9 per cent. greater than in the corresponding time of a year ago. In the month of May alone, bank clearings throughout the country showed a total increase of 10.5 per cent. over the same month last year and New England showed an increase of 17.1 per cent.

But in June, when business retrenchment became popular, gains have been very much smaller and in many cases actual losses are shown. In the week ending June 5 New England showed a decrease of 5.4 per cent. In the week ending June 12 it showed a decrease of 0.8 per cent. And so the tide of business contraction which was forced by the contraction of credits throughout the country is being written into reduced volumes of commercial transactions. This situation can be explained also, in part, by the fact that the business world usually experiences some let-up in activity around the mid-year period. It is the between seasons in many lines and the beginning of the holiday months.

(By Special Correspondence to The American Architect.)

Birmingham. — With a population just reported by the Government to be in excess of 178,000, Birmingham stands well toward the front in its urgent need for more dwellings and apartments in which to house its population. This condition, while not specially different from that prevailing throughout the country, is becoming more serious as the Federal Reserve Bank's effort at deflation strikes a note of discouragement for those who have been contemplating building on borrowed money. The local result of this has been the abandonment of quite a number of prospective efforts at construction which could not be carried forward without the aid of reasonable loans.

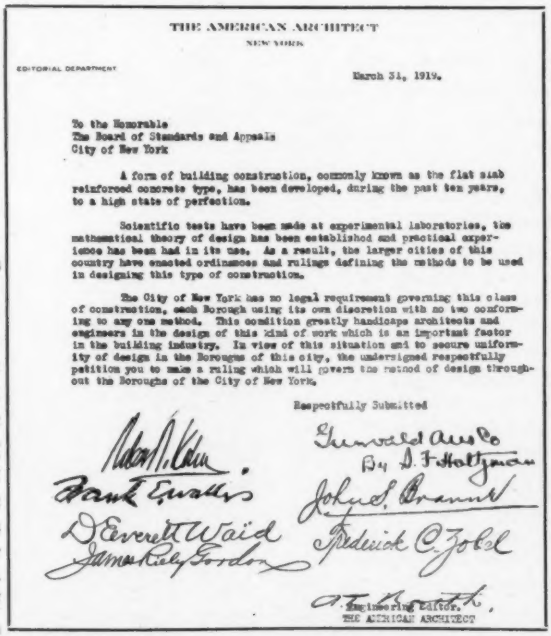


New York City Adopts Rules Governing Reinforced Concrete Flat Slab Design and Construction

Uniform Regulations Advocated by THE AMERICAN ARCHITECT Become Effective August 2, 1920

ON July 8, 1920, the Board of Standards and Appeals of New York City adopted regulations governing the design and construction of the flat slab type of reinforced concrete building. This marks a notable step in advance, and these regulations can be profitably studied by other cities.

New York City consists of five separate boroughs —Manhattan, Bronx, Kings, Queens and Richmond, each of which possesses an autonomous form of government, headed by a Borough President under whose jurisdiction comes the Building Bureau of that borough. Thus while the provisions of one building code govern throughout the city, there may be five different interpretations of a single section or clause. Prior to the creation of the Board of Standards and Appeals in 1916, the Superintendent of Buildings of each borough had the authority to adopt rules governing various phases of building construction, such as elevators, plumbing, reinforced concrete, etc., provided such rules were not in conflict with any specific provisions of the building code. All such rules remained in force until amended or superseded by new rules adopted by the Board of Standards and Appeals after public notice and hearing. Since these old rules varied in the different boroughs, the Board of Standards and Appeals has done much meritorious work in promulgating and adopting uniform rules superseding the older ones.



THE AMERICAN ARCHITECT
NEW YORK

EDITORIAL DEPARTMENT

March 31, 1919.

To the Honorable
The Board of Standards and Appeals
City of New York

A form of building construction, commonly known as the flat slab reinforced concrete type, has been developed, during the past ten years, to a high state of perfection.

Scientific tests have been made at experimental laboratories, the mathematical theory of design has been established and practical experience has been had in its use. As a result, the larger cities of this country have enacted ordinances and rulings defining the methods to be used in designing this type of construction.

The City of New York has no legal requirement governing this class of construction, each Borough using its own discretion with no two conforming to any one method. This condition greatly handicaps architects and engineers in the design of this kind of work which is an important factor in the building industry. In view of this situation and to secure uniformity of design in the Boroughs of this city, the undersigned respectfully petition you to make a ruling which will govern the method of design throughout the Boroughs of the City of New York.

Respectfully Submitted

Engineering Editor,
THE AMERICAN ARCHITECT

However, where rules existed, even though in need of revision, they at least furnished a guide to the designer. Where no rules existed and the matter was left entirely to the discretion of the superintendent of buildings of each borough added difficulties arose. This was exactly the situation with respect to the "flat slab" type of reinforced concrete construction. The reinforced concrete regulations of the building code made no provision for it, and each borough ap-

parently had different ideas as to how this form of design should be treated. Accordingly a building erected in Queens and approved by the Building Bureau there might be declared weak in Manhattan, and similarly for other boroughs. Such a condition was not so embarrasing to the architect when but comparatively few structures of this type were being built, but as their number increased, so did a most difficult situation, as the designer had no definite guide. Clearly some remedy was necessary.

This condition was brought to the attention of THE AMERICAN ARCHITECT early in 1919, by some of the leading architects and engineers of the city, and after an investigation made by Mr. Arthur T. North then Engineering (now Western) Editor, it was found that the only solution lay with the Board of Standards and Appeals, in whom was vested the power to adopt uniform rules governing such construction. Accordingly a petition to this effect was presented March 31, 1919, a reproduction of which is shown on page 89.

The matter was referred to a committee of the board and seemed to lay dormant for some time. In the meantime, realizing that the drafting of satisfactory rules was a most difficult task, and did not consist of simply duplicating those already in use in other cities, THE AMERICAN ARCHITECT at once set about to get the necessary machinery in motion for accomplishing this purpose, so that it could be of the greatest assistance to the City Board.

After a conference of those who signed the petition it was realized that each was exceedingly busy attending to his own business, and could not give the time needed to this highly specialized work. The situation was very aptly stated by Mr. Robert D. Kohn as follows:

"I have so many public obligations outside of my professional work that I cannot possibly assume an additional one (drafting flat slab rules). What is more to the point perhaps is that I am not at all qualified to be of assistance in such a matter."

The consensus of opinion was that a consulting engineer who could devote adequate time to the task was necessary, and no one seemed better qualified for the work than Mr. Rudolph P. Miller, who later agreed to take over this task. Shortly after retaining the services of Mr. Miller, Mr. George E. Strehan (who had just returned from overseas military service) and Mr. Miller became associated as consulting engineers, and as Mr. Strehan's previous experience was most valuable in this work, both cooperated in the preparation of the flat slab rules. Many drafts were prepared and numerous conferences held with those intimately connected with this type of construction. Members of the board were freely consulted, and a conference held with the several superintendents of buildings. It was an arduous task, however, and on the first of January, 1920, the acceptance of appointment as superintendent of buildings, Borough of Manhattan made necessary the relinquishment of this work by Mr. Miller, Mr. Strehan, continuing as consulting engineer. Months were consumed, but finally what seemed to be a satisfactory draft was prepared and 1,000 copies of it printed by THE AMERICAN ARCHITECT and mailed to leading architects and engineers throughout the country for criticism and comment. The replies received were on minor items. All criticism was carefully analyzed and several slight changes made, and the revised draft submitted to the Board of Standards and Appeals early in June, 1920. After consideration by a committee of the board, the rules were reported for public hearing, and on July 8 the revised rules printed below were adopted.

TABLE I.
COMPARISON OF MOMENT FACTORS,
REINFORCED CONCRETE FLAT SLAB DESIGN.
W = Total Load on Panel = wL^2 L = Length of Square Panel.
Dimension of Capital Assumed as 0.225 L; of Drop, as 0.33 L.

AUTHORITY	MOMENT SECTIONS				TOTAL MOMENT	REMARKS
	Z-COL. HEAD	MID	INNER	Z-OUTER		
NEW YORK CITY Rules Adopted 7-8-'20	$-\frac{1}{32}$ WL	$-\frac{1}{133}$ WL	$+\frac{1}{93}$ WL	$+\frac{1}{80}$ WL	$\frac{1}{11}$ WL	
CHICAGO CINCINNATI INDIANAPOLIS MINNEAPOLIS	$-\frac{1}{30}$ WL †$-\frac{1}{34}$	$-\frac{1}{180}$ WL †$-\frac{1}{185}$	$+\frac{1}{170}$ WL †$+\frac{1}{135}$	$+\frac{1}{60}$ WL †$+\frac{1}{66}$	$\frac{1}{15}$ WL †$\frac{1}{16.9}$	Allow Steel Stress of 18,000 lbs. sq in. Factors marked† are based on Steel Stress of 16,000 lbs. sq in.
PHILADELPHIA BALTIMORE	$-\frac{1}{32}$ WL	$-\frac{1}{128}$ WL	$+\frac{1}{128}$ WL	$+\frac{1}{80}$ WL	$\frac{1}{16.9}$ WL	
PITTSBURGH	$-\frac{1}{296}$ WL	NOT SPECIFIED	$+\frac{1}{128}$ WL	$+\frac{1}{64}$ WL	$\frac{1}{18.4}$ WL	W_2 = Total Positive Moment on Circular Section Thru Panel Ctr.
DETROIT	$-\frac{1}{37}$ WL	$-\frac{1}{110}$ WL	$+\frac{1}{128}$ WL	$+\frac{1}{64}$ WL	$\frac{1}{15.3}$ WL	
ST. LOUIS	$-\frac{1}{33}$ WL	$-\frac{1}{133}$ WL	$+\frac{1}{133}$ WL	$+\frac{1}{67}$ WL	$\frac{1}{16.0}$ WL	
NEW YORK CITY BOR. OF MANH. (Superceded Rules)	$-\frac{1}{24}$ WL	$-\frac{1}{140}$ WL	$+\frac{1}{140}$ WL	$+\frac{1}{48}$ WL	$\frac{1}{13}$ WL	
TAYLOR & THOMPSON	$-\frac{1}{27.3}$ WL	$-\frac{1}{157}$ WL	$+\frac{1}{104}$ WL	$+\frac{1}{69.3}$ WL	$\frac{1}{15.1}$ WL	
MENSCH	$-\frac{1}{30.6}$ WL	$-\frac{1}{768}$ WL	$+\frac{1}{128}$ WL	$+\frac{1}{51.4}$ WL	$\frac{1}{13.7}$ WL	
S. M. I.	$-\frac{1}{86}$ WL	$-\frac{1}{172}$ WL	$+\frac{1}{104}$ WL	$+\frac{1}{92}$ WL	$\frac{1}{18.5}$ WL	
NICHOLS					$\frac{1}{11.2}$ WL	Distribution not Specified
JOINT COMMITTEE WASHINGTON BOSTON	*$-\frac{1}{26}$ WL $-\frac{1}{32}$ WL	$-\frac{1}{104}$ WL	$+\frac{1}{138}$ WL	*$+\frac{1}{28}$ WL $+\frac{1}{42.5}$ WL	$\frac{1}{13}$ WL	Pos. Moment = 37½% Total. Neg. Moment = 62½% Total. Minimum Specified Values Given for Each Section.
AM. CONCRETE INST.	*$-\frac{1}{36.8}$ WL $-\frac{1}{28.5}$ WL	$-\frac{1}{154}$ WL	$+\frac{1}{128}$ WL	*$+\frac{1}{83.3}$ WL $+\frac{1}{62.5}$ WL	$\frac{1}{15.4}$ WL	Pos. Mom. = 33⅓% Total. Neg. Mom. = 66⅔% Total. Min. Spec. Values for Each Sec.
FORMULAE Derived Analytically	*$-\frac{1}{28}$ WL $-\frac{1}{32}$ WL	$-\frac{1}{178}$ WL	$+\frac{1}{118}$ WL	*$+\frac{1}{113}$ WL $+\frac{1}{87}$ WL	$\frac{1}{18.1}$ WL	Pos. Mom. = 35 % Total Neg. Mom. = 65 % Total Min. Spec. Values for Each Sec.

* With and Without Drops. NOTE: Third Value of Joint Committee Moment on Outer Section used to Determine Slab Thickness Only

In the preparation of the rules the data obtained from the many extensometer tests made both on actual structures and at recognized experimental laboratories on test structures, was carefully analyzed and considered. It has been stated that the fundamental principles of applied mechanics determine the design of flat slabs as they do of all other structures. Yet designing engineers and mathematicians differ radically in the application of those fundamental principles to this type of structure because there exist factors which have not yet been satisfactorily analyzed and reduced to a basis of practical design.

A table showing how the moment coefficients contained in these rules compare with those specified by other authorities is here included, as well as diagrams (Plates I and II) which will more clearly illustrate the terms used.

Several articles have appeared in THE AMERICAN ARCHITECT dealing with the waste of materials of-

ten required by too conservative building codes. THE AMERICAN ARCHITECT took the action it did because it believed that sufficient tests had been made to demonstrate the possibility of a more economical design than that which had existed in several of the boroughs, as well as with a view to simplifying the work of the designing engineer, and providing for him a guide by which to work. At the present time this is more necessary than at the time the original petition was presented, in order that not a single pound of steel or yard of concrete above that required, be placed in the building.

The economy thus made possible is clearly demonstrated by the following incident: A large reinforced concrete building for which McKenzie, Voorhees & Gmelin are architects will shortly be constructed in the lower part of Manhattan Island. The design worked out under the rules just adopted will permit a saving of approximately $35,000, compared with a design based on the requirements previously in force in the Borough of Manhattan.

Mr. John P. Leo, chairman of the Board of Standards and Appeals, himself an architect, is to be commended on his attitude of support and co-operation on this matter, which is in line with his previous stand on other matters which have come before the Board, where economy of construction was possible without sacrificing safety.

Mr. Leo has just been reappointed by Mayor Hylan for a further term of three years. New York City is fortunate in having so able and conscientious a man serving at the head of this important Board.

Rules Governing the Design of Reinforced Concrete Flat Slabs in New York City

Adopted by the Board of Standards and Appeals July 8, 1920. Effective August 2, 1920

Rule 1. *Application.* The rules governing the design of reinforced concrete flat slabs shall apply to such floors and roofs, consisting of three or more rows of slabs, without beams or girders, supported on columns, the construction being continuous over the columns and forming with them a monolithic structure.

Rule 2. *Compliance with Building Code.* In the design of reinforced concrete flat slabs, the provisions of article 16 of the building code shall govern with respect to such matters as are specified therein.

Rule 3. *Assumptions.* In calculations for the strength of reinforced concrete flat slabs, the following assumptions shall be made:

(a) A plane section before bending remains plane after bending;

(b) The modulus of elasticity of concrete in compression within the allowable working stresses is constant;

(c) The adhesion between concrete and reinforcement is perfect;

(d) The tensile strength of concrete is nil;

(e) Initial stress in the reinforcement due to contraction or expansion in the concrete is negligible.

Rule 4. *Stresses.* (a) The allowable unit shear in reinforced concrete flat slabs on bd section around the perimeter of the column capital shall not exceed one hundred twenty (120) pounds per square inch; and the allowable unit shearing stress on the bjd section around the perimeter of the drop shall not exceed sixty (60) pounds per square inch, provided that the reinforcement is so arranged or anchored that the stress may be fully developed for both positive and negative moments.

(b) The extreme fibre stress to be used in concrete in compression at the column head section shall not exceed seven hundred fifty (750) pounds per square inch.

Rule 5. *Columns.* For columns supporting reinforced concrete flat slabs, the least dimension of any column shall be not less than one-fifteenth (1/15) of the average span of any slabs supported by the columns; but in no case shall such least dimension of any interior column supporting a floor or roof be less than sixteen (16) inches when round nor fourteen (14) inches when square; nor shall the least dimension of any exterior column be less than fourteen (14) inches.

Rule 6. *Column Capital.* Every reinforced concrete column supporting a flat slab shall be provided with a capital whose diameter is not less than 0.225 of the average span of any slabs supported by it. Such diameter shall be measured where the vertical thickness of the capital is at least one and one-half (1½) inches, and shall be the diameter of the inscribed circle in that horizontal plane. The slope of the capital considered effective below the point where its diameter is measured shall nowhere make an angle with the vertical of more than forty-five (45) degrees. In case a cap of less dimensions than hereinafter described as a drop, is placed above the column capital, the part of this cap enclosed within the lines of the column capital extended upward to the bottom of the slab or drop at the slope of forty-five (45) degrees may be considered as part of the column capital in determining the diameter for design purposes.

Rule 7. *Drop.* When a reinforced concrete flat slab is thicker in that portion adjacent to or surrounding the column, the thickened portion shall be known as a drop. The width of such drop when used, shall be determined by the shearing stress in the slab around the perimeter of the drop, but in no case shall the width be less than 0.33 of the average span of any slabs of which it forms a part. In computing the thickness of drop required by the negative moment on the column head section, the width of the drop only shall be considered as effective in resisting the compressive stress, but in no case shall the thickness of such drops be less than 0.33 of the thickness of the slab. Where drops are used over interior columns, corresponding drops shall be employed over exterior columns and shall extend to the sixth (1/6) point of the panel from the center of the column.

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Rule 8. *Slab Thickness.* The thickness of a reinforced concrete flat slab shall be not less than that derived by the formulae $t = 0.024\ L\ \sqrt{w} + 1\frac{1}{2}$ for slabs without drops, and $t = 0.02\ L\ \sqrt{w} + 1$ for slabs with drops, in which t is the thickness of the slab in inches, L is the average span of the slab in feet, and w is the total live

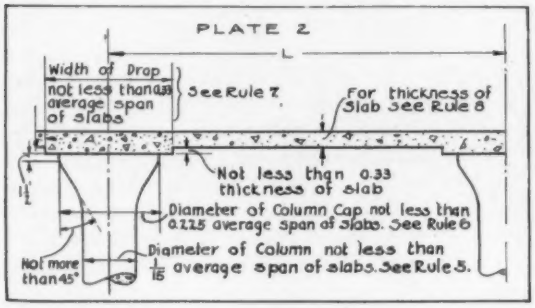


PLATE 2
L
Width of Drop not less than 1/3 average span of slabs
See Rule 7
For thickness of Slab See Rule 8
Not less than 0.33 thickness of slab
Diameter of Column Cap not less than 0.225 average span of slabs. See Rule 6
Diameter of Column not less than 1/15 average span of slabs. See Rule 5.
Not more than 45°

and dead load in pounds per square foot; but in no case shall this thickness be less than one-thirty-second (1/32) of the average span of the slab for floors, nor less than one-fortieth (1/40) of the average span of the slab for roofs, nor less than six (6) inches for floors nor less than five (5) inches for roofs.

Rule 9. *Reinforcement.* (a) In the calculation of moments at any section, all the reinforcing bars which cross that section may be used, provided that such bars extend far enough on each side of such section to develop the full amount of the stress at that section. The effective area of the reinforcement at any moment section shall be the sectional area of the bars crossing such section multiplied by the sine of the angle of such bars with the plane of the section. The distribution of the reinforcement of the several bands shall be arranged to fully provide for the intermediate moments at any sections.

(b) Splices in bars may be made wherever convenient but preferably at points of minimum stress. The length of any splice shall be not less than eighty (80) bar diameters and in no case less than two (2) feet. The splicing of adjacent bars shall be avoided as far as possible. Slab bars which are lapped over the column, the sectional area of both being included in the calculation for negative moment, shall extend to the lines of inflection beyond the column center.

(c) When the reinforcement is arranged in bands, at least fifty (50) per cent. of the bars in any band shall be of a length not less than the distance center to center of columns measured rectangularly and diagonally; no bars used as positive reinforcement shall be of a length less than half (½) the panel length plus forty (40) bar diameters for cross bands, or less than seven-tenths (7/10) of the panel length plus forty (40) bar diameters for diagonal bands and no bars used as negative reinforcement shall be of a length less than half (½) the panel length. All reinforcement framing perpendicular to the wall in exterior panels shall extend to the outer edge of the panel and shall be hooked or otherwise anchored.

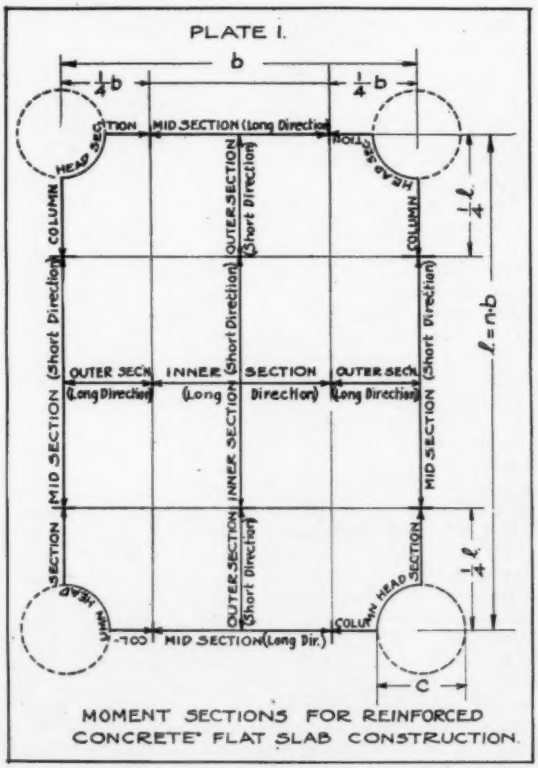
(d) Adequate means shall be provided for properly maintaining all slab reinforcement in the position assumed by the computations.

Rule 10. *Line of Inflection.* In the design of reinforced concrete flat slab construction, for the purpose of making calculations of the bending moments at sections other than defined in these rules, the line of inflection shall be considered as being located one-quarter (¼) the distance, center to center, of columns, rectangularly and diagonally, from center of columns for panels without drops, and three-tenths (3/10) of such distance for panels with drops.

Rule 11. *Moment Sections.* For the purpose of design of reinforced concrete flat slabs, that portion of the section across a panel, along a line midway between columns, which lies within the middle two quarters of the width of the panel shall be known as the inner section, and those portions of the section in the two outer quarters of the width of the panel shall be known as the outer sections. Of the section which follows a panel edge from column to column and which includes the quarter perimeters of the edges of the column capitals, that portion within the middle two quarters of the panel width shall be known as the mid section and the two remaining portions, each having a projected width equal to one-quarter of the panel width, shall be known as the column head sections.

Rule 12. *Bending Moments.* In the design of reinforced concrete flat slabs the following provisions with respect to bending moments shall be observed. In the moment expressions used:

W is the total dead and live load on the panel under consideration, including the weight of drop whether a square, rectangle or parallelogram;



MOMENT SECTIONS FOR REINFORCED CONCRETE FLAT SLAB CONSTRUCTION.

W_1 is the total live load on the panel under consideration;

L is the length of side of a square panel center to center of columns; or the average span of a rectangular panel which is the mean length of the two sides;

n is the ratio of the greater to the less dimension of the panel;

h is the unsupported length of a column in inches, measured from top of slab to base of capital;

I is the moment of inertia of the reinforced concrete column section.

A. Interior Square Panels. The numerical sum of the positive and negative moments shall be not less than 1/17 W L. A variation of plus or minus five (5) per cent. shall be permitted in the expression for the moment on any section, but in no case shall the sum of the negative moments be less than sixty-six (66) per cent. of the total moment, nor the sum of the positive moments be less than thirty-four (34) per cent. of the total moment for slabs with drops; nor shall the sum of the negative moments be less than sixty (60) per cent. of the total moment, nor the sum of the positive moments be less than forty (40) per cent. of the total moment for slabs without drops.

1. In *two-way systems,* for slabs with drops, the negative moment resisted on two column head sections shall be — 1/32 W L; the negative moment on the mid section shall be — 1/133 W L; the positive moment on the two outer sections shall be + 1/80 W L and the positive moment on the inner section shall be + 1/133 W L and for slabs without drops, the negative moment resisted on two column head sections shall be — 1/36 W L, the negative moment on the mid section shall be — 1/133 W L, the positive moment on the two outer sections shall be + 1/63 W L and the positive moment on the inner section shall be + 1/133 W L.

2. In *four-way systems,* the negative moments shall be as specified for Two-Way Systems; the positive moment on the two outer sections shall be + 1/100 W L, and the positive moment on the inner section shall be + 1/100 W L for slabs with drops; and the positive moment on the two outer sections shall be + 1/74 W L, and the positive moment on the inner section shall be + 1/100 W L, for slabs without drops.

3. In *three-way systems,* the negative moment on the column head and mid sections and the positive moment on the two outer sections, shall be as specified for Four-Way Systems. In the expression for the bending moments on the various sections, the length L shall be assumed as the distance center to center of columns, and the load W as the load on the parallelogram panel.

B. Interior Rectangular Panels.

1. When the ratio n does not exceed 1.1, all computations shall be based on a square panel of a length equal to the average span, and the reinforcement shall be equally distributed in the short and long directions according to the bending moment coefficients specified for interior square panels.

2. When the ratio n lies between 1.1 and 1.33, the bending moment coefficients specified for interior square panels shall be applied in the following manner:

(a) In *two-way systems,* the negative moments on the two column head sections and the mid section and the positive moment on the two outer sections and the inner section at right angles to the long direction shall be determined as for a square panel of a length equal to the greater dimension of the rectangular panel; and the corresponding moments on the sections at right angles to the short direction shall be determined as for a square panel of a length equal to the lesser dimension of the rectangular panel. In no case shall the amount of reinforcement in the short direction be less than two-thirds (2/3) of that in the long direction. The load W shall be taken as the load on the rectangular panel under consideration.

(b) In *four-way systems,* for the rectangular bands, the negative moment on the column head sections and the positive moment on the outer sections shall be determined in the same manner as indicated for *two-way systems.*

For the diagonal bands, the negative moments on the column head and mid sections and the positive moment on the inner section shall be determined as for a square panel of a length equal to the average span of the rectangle. The load W shall be taken as the load on the rectangular panel under consideration.

(c) In *three-way systems,* the negative and positive moments on the bands running parallel to the long direction shall be determined as for a square whose side is equal to the greater dimension; and the moments on the bands running parallel to the short direction shall be determined as for a square whose side is equal to the lesser dimension. The load W shall be taken as the load on the parallelogram panel under consideration.

C. Exterior Panels. The negative moments at the first interior row of columns and the positive moments at the center of the exterior panels on moment sections parallel to the wall, shall be increased twenty (20) per cent. over those specified above for interior panels. The negative moment on moment sections at the wall and parallel thereto shall be determined by the conditions of restraint, but the negative moment on the mid section shall never be considered less than fifty (50) per cent. and the negative moment on the column head section never less than eighty (80) per cent. of the corresponding moments at the first interior row of columns.

D. Interior Columns shall be designed for the bending moments developed by unequally loaded panels, eccentric loading or uneven spacing of columns. The bending moment resulting from unequally loaded panels shall be considered as 1/40 W_1 L, and shall be resisted by the columns immediately above and below the floor line under consideration in direct proportion to the values of their ratios of I/h.

E. Wall Columns shall be designed to resist bending in the same manner as interior columns, except that W shall be substituted for W_1 in the formula for the moment. The moment so computed may be reduced by the counter moment of the weight of the structure which projects beyond the center line of the wall columns.

F. Roof Columns shall be designed to resist the total moment resulting from unequally loaded panels, as expressed by the formulae in paragraphs (D) and (E) of this rule.

Rule 13. *Walls and Openings.* In the design and construction of reinforced concrete flat slabs, additional slab thickness, girders or beams shall be provided to carry any walls or concentrated loads in addition to the specified uniform live and dead loads. Such girders or beams shall be assumed to carry twenty (20) per cent. of the total live and dead panel load in addition to the wall load. Beams shall also be provided in case openings in the floor reduce the working strength of the slab below the prescribed carrying capacity.

Rule 14. *Special Panels.* For structures having a width of less than three (3) rows of slabs, or in which exterior drops, capitals or columns are omitted, or in which irregular or special panels are used, and for which the rules relating to the design of reinforced flat slabs do not directly apply, the computations in the analysis of the design of such panels, shall, when so required, be filed with the superintendent of buildings.

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Report on Trip to Princeton, College of City of New York, Yale and Harvard for the Purpose of Inspecting the Stadia at those Universities

Part I

By HOWARD DWIGHT SMITH

IT is a well established principle of design that in extensive new operations, the lessons of success and failure of preceding operations of similar nature be carefully studied. Progress in all lines of human endeavor is largely based upon this principle. It is particularly so in architecture and engineering.

Documents and records covering the subject of stadia have been carefully studied in connection with the design of a new Stadium at Ohio State University. The problems confronting the builders of classic times in the erection of their amphitheaters, Stadia, circuses and odeons have been studied. The work of modern engineers and architects in contemporary structures as described and discussed in current publications has also been very carefully studied. Plans, sight lines, cross sections, seating facilities, crowd control and construction methods have influenced very largely the study of the impending problem at Ohio State.

It was with a view to making the intensive study of contemporary work as effective as possible in the light of experience, that an inspection trip was authorized by the University Cabinet and the Athletic Board. This inspection trip, made from May 7 to May 14 included visits to Princeton University at Princeton, N. J., the College of the City of New York, Yale University at New Haven, Conn., and Harvard University at Cambridge, Mass. An inspection was also made of the United States Army Supply Base, Brooklyn, N. Y., which is recognized as one of the most successful monolithic structures of the present decade.

In order best to obtain the proper benefit from an inspection the studies and observations were of two kinds. The first was a careful examination of the various structures as to their present physical condition, state of repair and the relations between original methods of construction in each case and their present condition. The second form of observation consisted in discussions with the men at the institutions who have charge of the athletic plants, men who are in a position to judge as to the effectiveness of the structures and equipment with which they work. These men unprejudiced by structural preconceptions are qualified to say wherein their stadia have been successful and wherein they might be improved.

The extent of the second phase of the inspection at Princeton was somewhat limited on account of the absence from the University of Dr. Raycroft, the Director of Athletics. The efficiency of the plan and seating arrangement, and the handling of the crowds at big games has been fairly well established in the six years of its use.

The inspection of the Stadium was made dur-

THE PALMER STADIUM, PRINCETON, N. J. H. J. HARDENBERGH, *ARCHITECT*
Note openings to runways giving access to and egress from seating sections

MAIN ENTRANCE, PALMER STADIUM

VIEW DURING CONSTRUCTION

ing a rain storm, but all parts of the structure were examined. The first general impression obtained of the structure was that it was very brown or tannish, rather than white or gray, as most of the photographs would seem to indicate. This impression was perhaps accentuated by the fact that the surface of the structure was wet. Whether this brown appearance is due to artificial coloring matter in the concrete or whether it is due to the color of the sand used was not determined.

As for architectural design, it is evident from the details that the architect is striving to make the structure look "Tudor" in style, in order that it may be somewhat in keeping with the Tudor or Collegiate Gothic buildings of the campus. This perhaps is somewhat forced, for the mass of the structure hardly lends itself to the spirit of the Tudor style without a great deal of intricate and ornamental detail. The pointed-top buttresses at each of the outside piers do not sufficiently satisfy this requirement, and the thin exterior arcade forms only a scant screen for the concrete piers, posts, girders, beams and rafters of the interior structure which are anything but Tudor in effect.

The plan of the Princeton Stadium has the shape of a letter U, in which the closed end is flattened into a three-centered curve, in the center of which is a large entrance feature consisting of a wide archway flanked by two hexagonal towers. The structure is 652 feet long and 520 feet wide, seating about 42,000 people. The seats are reached by a series of 26 runways which are slightly inclined up from the exterior arcade to openings or "eyes" located about half way up the entire tier of seats. The level of the playing field is about 15 feet below the general level of the ground outside of the stadium. The topography shows a falling off from the open end so that the straightaway portion of the running track does not cut into this higher general level. The entire area surrounding the Stadium is fenced off in order to control the approach of crowds toward the structure itself. The "sight line" of the cross section is considered quite satisfactory, and the location of the track with reference to the inside wall of the Stadium is such that all spectators can see the track events. This is in contrast to the unsatisfactory condition at Harvard which will be discussed later. This inner wall is 4 feet 9 inches high, and along the two sides it is 5 feet from the edge of the running track. A curtain wall 3 feet high marks the edge of the track and serves as a suitable barrier between the first row of seats and the track itself. Experience has demonstrated that the greatest difficulty in handling crowds at track meets is that of keeping the spectators off of the field. It is desirable for pur-

EXTERIOR, PALMER STADIUM, PRINCETON, N. J.
Main entrance can be seen at extreme left

UNDERSIDE SEATING SECTIONS

poses of the convenience of great crowds leaving the Stadium after games or meets that access to the field be provided, but ample provision should be made properly to control such access. Some space under the seating structure has been used for storage of field apparatus and ground keeper's tools, but no extensive use of the space for housing has been attempted.

A careful examination of the Stadium at Princeton discloses a number of apparent defects in construction. There is evidence of deterioration in many places. This deterioration takes the form of cracks, spalls, buckling and breaking off of finish surfaces, and cracking of outside piers. In some places the surface of the seats has scaled and broken up rather extensively. In other places frost action has evidently caused some damage where small cracks have not been pointed up. In two of the exterior piers to the left of the main entrance there are rather large transverse cracks, about midway of their heights, from which there has been some extensive seepage. This seepage appears to be due to the fact that water gets into the body of the structure from above and finds its way out at these cracks.

What is written here must not be assumed to be by way of caustic criticism of the Palmer Stadium or those who have designed and built it, nor of those who are now responsible for its maintenance. It is only intended here to record some personal observations with the hope that while the good features of the Stadium, particularly as to plan arrangement may be used as inspiration in new work, the repetition of some of the less desirable features may be avoided. Articles appearing in the current technical publications upon the completion of any engineering operation of great magnitude or singular importance are usually of a highly lauditory character, in which, quite rightly, all the distinctive features are emphasized and rightly praised. In the light of time and the experience of usage some of these features prove most admirably suited to the purpose for which they were intended. Others do not and these observations have as their object the notation of features which come in either of these two classes.

It is probably true that the absence of expansion joints in sufficient number and size is partly responsible for some of the cracking and disintegrating which is apparent in many places. Some tight or "butt" joints are noticeable but there is not sufficient space allowed for the "play" of expansion and contraction. The opinion is also hazarded that the materials and workmanship throughout the structure are not of that laboratory uniformity which is so essential to perfection in reinforced concrete construction.

Great publicity has been given to the incredible speed with which the Princeton Stadium was built. It is barely possible that the demand for speed may have had a deletorious effect upon supervision. All of these things are probably contributory factors to the condition of the Princeton Stadium to-day. While it ranks as the best in its convenience of arrangement and its facilities, it cannot be truthfully said that it compares favorably with other structures of its class in its structural qualities.

(For details of construction refer to "Engineering and Contracting" May 26, 1915, Vol. XLIII, No. 21, page 472).

(To be continued)

VIEW SHOWING SUPPORTING CONSTRUCTION